

Colorado Medicine

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VOL. I.

DENVER, JANUARY, 1904.

No. 3

LEADING ARTICLES

FORMALDEHYD IN URINE.

Dr. Kenney's painstaking experiments (see page 107) have established beyond question that the presence of formaldehyd in urine may lead to erroneous findings in using the tests for albumin. The reaction appearances caused by the presence of albumin or the presence of formaldehyd are so nearly alike as to be practically indistinguishable. In addition to this apparent reaction for albumin, so important to life insurance examiners particularly, urine containing formaldehyd soon throws down a spontaneous whitish deposit, which appears under the microscope as clear, roundish, highly refractive bodies, resembling the spontaneous sediment sometimes observed in old specimens of formalin; though generally larger, as is usual in a weaker solution.

Both of these deposits, on drying and heating, react to the ordinary tests for formaldehyd. We may conclude, therefore, that they consist of the solid, triple polymer of formaldehyd, termed paraformaldehyd or paraform, which breaks up into the gas formaldehyd on heating.

The solidification and polymerization of formaldehyd takes place slowly on exposure to the air, through the catalyzing action of atmospheric oxygen. This change may take place much more rapidly in the presence of oxidizing agents, such as nitric acid, especially in organic solutions, like the urine, giving rise to false conclusions, as has been shown by Dr. Kenney.

An additional point of considerable interest is the probability, after giving urotropin and preparations containing this

drug, of finding what seems to be a trace of albumin, due in reality to the formaldehyd and ammonia into which urotropin breaks up in the urinary tract. Finally, the formaldehyd, polymerized in part into granular paraform, as *in vitro*, might possibly serve as the nucleus of a calculus which it was designed to prevent.

EDWARD C. HILL.

THE PASTEUR INSTITUTE

The Pasteur Institute is largely a charitable establishment. It is financed by the French government and has an annual endowment from the city of Paris. There have also been numerous private bequests of considerable magnitude and there is a steady income from the sale of various vaccines and antitoxins made by the institute. When the antitoxin treatment for diphtheria first came in vogue, the *Figaro* opened a subscription in its columns which soon amounted to the sum of one million francs. This sum served to build stables, laboratories and other buildings; and to purchase the needful supply of horses and other animals necessary for carrying on this work. In return for this support, the institute gives to the deserving poor, gratuitous treatment for numerous communicable diseases and offers to physicians and scientists instruction in micro-biology in one of the finest appointed laboratories in the world at a nominal cost.

Starting from small beginnings, at the present time the Pasteur Institute occupies a territory larger than six acres. The main buildings are situated on either side of the Rue Dutot, a short distance from the Boulevard Pasteur. On the left hand side in a large enclosure are several buildings the chief of which is the Bacteriologi-

cal Department proper. Here there are several "services." One is by Roux, the "service" of micro-biology, where two courses a year are given in lectures and laboratory work to physicians, scientists and such other acceptable persons as may apply. The price of the course is \$10. Here there are also several divisions where original research may be carried on under the direction of Roux, Chamberland and Metchnikoff.

Another "service" in the same building is under the direction of Metchnikoff, where original work in immunity is carried on, particularly in that branch of the science founded and defended by Metchnikoff and which comes under the heading of phagocytosis. From this laboratory has emanated the work of Bordet and others along similar lines. Much light has been thrown on the mechanism of some of the intricate problems of immunity by the original research done here along the lines of the agglutins, precipitins, lysins and anti-lysins, etc.

The "service" of hydrophobia is likewise situated in the same building. Here is the cord room where the spinal cords of the rabbits dead of hydrophobia are preserved for maceration and injection into persons bitten by rabid animals. The clinic for this disease averages about 1,500 persons treated per annum.

Under the direction of Chamberland in the same building are prepared vaccines for anthrax and hog erysipelas. These vaccines, prepared by attenuating the specific bacteria of the disease in question are made and distributed in great quantities. In France alone it is estimated that the use of these vaccines has resulted in saving many millions of dollars to the agriculture of the country. Tuberculin and mallein are also prepared here, the latter being supplied gratuitously to the veterinary department of the French army, its use being compulsory by ministerial decree.

Within the same grounds are several other buildings, one of which is devoted exclusively to work with the bubonic plague bacillus. There is also a large hospital for animals under observation, and several sheds where the animals of the different "services" are housed and observed.

In the enclosure on the other side of the Rue Dutot are several other buildings, the chief of which are the institute of physiological chemistry and the hospital for communicable diseases. The first of these buildings was given to the Pasteur Institute by the Baronness de Hirsch. The building is replete with all known appliances for this intricate branch of biology. One portion of the structure is devoted to agricultural chemistry and agricultural micro-biology, such as the cultivation of various yeast cells in brewing. In another portion of the building are prepared the toxins of diphtheria and tetanus under the direction of Martin and his assistants. The toxins here prepared are transported to Garches, a small town outside of Paris, where the horses destined to produce the various antitoxins are inoculated and the serums are drawn, tested and exported to various places. In another division of the Physiological Institute, Marmoreck was formerly engaged with his antistreptococcus serum.

The hospital for communicable diseases is situated in the same grounds. This building was a gift to the Pasteur Institute by a lady who desired that her name be withheld from the public. Each room in the hospital has two doors, one entering from the outside and another leading into the central corridor. The partitions of the rooms are of glass. This hospital is devoted to the use of patients with acute cases of infection where they may receive the different varieties of antitoxin treatment; there is also provision made here for appropriate cases of hydrophobia.

Such, in brief, is the Pasteur Institute

of to-day. A fitting monument to the modest and great man who founded it. Pasteur's body reposes in a magnificent tomb situated in one of the buildings on the left hand side of the Rue Dutot. Here it would seem as if his benevolent spirit arising from the grave serves to inspire those whom he has left behind to further efforts in behalf of suffering humanity. Pasteur shares the honors with Robert Koch in having founded the modern science of Bacteriology.

WM. C. MITCHELL.

NOTE AND COMMENT.

The Western Surgical Meeting.—The meeting of the Western Surgical and Gynecological Association, held in Denver December 28 and 29 was a notable one. To hear Mayo discuss the surgical treatment of goitre, or Ferguson set forth the history and hopes of renal surgery, was inspiring as well as instructive. A half-dozen other topics were taken up in the same masterly way. Attendance on the two days' crowded sessions would have astonished any surgeon who never attended a medical gathering west of the Mississippi. One who has some acquaintance with the medical profession of the West confesses surprise at the number of surgeons of national and international reputation gathered to a meeting which did not claim to be a representative national body. But this surprise was swallowed up in the greater one, that these famous men found in their colleagues an average of ability, critical appreciation and judgment equal to that of any national or international gathering. Evidently they knew what to expect in their Association, and the Denver Meeting did not disappoint them.

Lists of Officers and Committees of the Colorado State Medical Society will be found on the inside "cover" pages of this number, facing the first and last numbered pages of reading matter.

ORIGINAL PAPERS

OSTEO AND RHEUMATOID ARTHRITIS.

B. C. LEAVITT, M. D., DENVER.

Only a few years ago every case of appendicitis was called inflammation of the bowels, the patient usually dying after medicines and local applications had been prescribed. To-day thousands are living in perfect health after operation, and thousands more might be living, if the diagnosis had been promptly made and operation had immediately followed. Heart failure is not allowed to be given as the cause of death, by many health authorities. Chronic rheumatism is now considered to be as inaccurate a diagnosis as inflammation of the bowels where appendicitis is present, or heart failure where there is valvular disease. This is a term that has been given to every kind of disease of the bones and joints, and the patient has been told that nothing more could be done for him. Orthopedic work of recent years has demonstrated that he can be very greatly helped, and often entirely cured, and has proved that there is no such disease as "chronic rheumatism." This is a term fully as indefinite as heart failure. In place of this, there is now given the diagnosis of septic joint, associated with tuberculosis, typhoid fever, abscess, diphtheria, tonsilitis, gonorrhea, or some other infective disease; or flat foot, floating cartilage, coxa vara, scoliosis, osteo or rheumatoid arthritis, and numerous other distinct diseases.

This paper has to do with osteo and rheumatoid arthritis. These terms have no more connection with rheumatism than they have with kidney disease. They have been often classed under one head, and called arthritis deformans, but they are now considered to be two separate and distinct diseases. Osteitis deformans, or Paget's disease, is another term that is

often confusing; but this is an entirely different disease, being a chronic inflammation of the bones, usually one or more of the long ones, sometimes of the bones of the skull, causing enlargement of the head.

As to etiology, both osteo and rheumatoid arthritis are generally supposed to be due to bacteria of some kind. In osteo arthritis it may be said, in a general way,

to double what are taken in, the cartilages waste away, leaving the edges of the bones bare, and then these edges fuse together, making the joint stiff. The bones of rheumatoid seem to undergo fatty degeneration, while in the osteo, the bones are larger and more firm, from the deposit



RHEUMATOID ARTHRITIS OF HAND. Destruction of cartilage, bony fusion at carpus, second and third metacarpophalangeal, and first and second phalangeal articulations. Contrast with osteo-arthritic hand, and with normal outlines of carpus and metacarpus in latter.

that the bones are the seat of disease, in rheumatoid, the synovial membranes and the cartilages are affected. In both diseases there is swelling at first, but in the former this is followed by permanent enlargement, while in the latter atrophy occurs, these changes being clearly shown by the X-rays.

In the rheumatoid variety it has been found that the calcium salts are excreted



OSTEO-ARTHRITIS OF HAND. Lesion mostly confined to terminal ends of second phalanges. Otherwise normal hand. Contrast the regular outlines of carpus and metacarpus with the indefinite outlines of rheumatoid hand.

of bone. X-rays show the bones of the osteo variety to be enlarged, the resultant deformity being due to irregular bony growths, while in the rheumatoid, the soft parts, and the inter-articular cartilages, are atrophied.

Osteo-arthritis may occur in any of the bones from the top of the spine to the ends of the fingers or toes. This disease of the spine is called spondylitis deformans. The inflammation and the bony enlargement

press upon the nerves as they pass through the foramina of the vertebræ, the pain caused by this pressure radiating to the parts supplied by the various nerves. In a large per cent of the cases of osteo-arthritis of the spine, the sciatic nerve is af-

ected, giving rise to the condition which is termed sciatica, or sciatic rheumatism, this really having nothing to do with rheumatism. There is no tenderness along the course of the sciatic nerve, either in the back or thigh, upon pressure, and the pain is caused by the disease in the spinal column. There is, however, rigidity in some part of the dorsal or lumbar region. The patient is first told to stand as straight as possible, holding the knees together, and to bend forward as if to attempt to pick up some object from the floor. The back is seen to be held rigid

in some part of its course, the knees are separated, and the patient will try to place one hand upon his leg or knee, attempting to put the other to the floor, carrying the body to one side, and often complaining of severe pain. Even in cases not far advanced it is impossible to reach far forward. Upon the patient again standing erect, there is also a limitation of motion from side to side, usually more upon one side than upon the other. Backward motion is also limited, this serving to dif-



OSTEO-ARTHRITIS OF KNEE. Cartilaginous thickening, and osteophytes.



RHEUMATOID ARTHRITIS OF KNEE. General atrophy of bone.

ferentiate the diagnosis from torn aponeurosis, so-called stitch in the back, as in the case of torn aponeurosis the muscular tension is relieved by the backward movement, and the motion in this direction is free. I have seen a case of this nature differentiated from osteo-arthritis at once because of this difference.

Some of those with osteo-arthritis of the spine complain most of the pain being in the terminal ends of the affected nerves, while others state that it is nearer the seat of the disease, the latter condition often leading to a diagnosis of lumbago. If in

ferentiate the diagnosis from torn aponeurosis, so-called stitch in the back, as in the case of torn aponeurosis the muscular tension is relieved by the backward movement, and the motion in this direction is free. I have seen a case of this nature differentiated from osteo-arthritis at once because of this difference.

the anterior part of the spine, there may be extreme pain in the back of the abdomen, which may be mistaken for abdominal disease. During the day, the muscles are held in constant tension, in the effort to support the spine, but at night,

expansion of the lungs impossible, and thus being the cause of disease of those organs.

Looking for these symptoms ought to be as much a regular routine as examining the heart or lungs. If this disease is recognized in its earlier stages, or even after running one or two years, all pain can be stopped inside of a month, and the



NORMAL KNEE, showing distinct line of cartilage between femur and tibia.



RHEUMATOID ARTHRITIS OF KNEE. No line of cartilage separating femur and tibia. Contrast with normal knee.

during sleep, this tension is relaxed, and the patient is often awakened by an extreme paroxysm of pain, resulting from the crowding together of the diseased vertebræ. Sometimes he cries out so that he can be heard in adjoining rooms. Coughing, sneezing, and deep inspiration cause severe pain, at times. Paralysis of the limbs, or even of the bladder, may result. In the most advanced cases, the spine and ribs become ankylosed, making

disease arrested. This is done by applying a proper support, usually a plaster jacket, in a proper way, which limits motion at the seat of the disease, and stops the irritation and muscular spasm, and thus allows the inflammatory disturbance about the foramina to go down, the pressure upon the nerves being relieved. In applying the jacket, it should be carried from the tops of the trochanters to the axillæ. The patient stands in as

nearly an upright position as he can without pain, the hands grasping some object slightly over his head. Any attempt to straighten the spine is unbearable.

For two or three days the pain may continue, though in many cases it is relieved in as many hours. During September of this year, a patient who received this method of treatment had been unable to sit up half an hour at a time. The next

night, turning upon his sides, while before he could only sleep a few hours, having to remain on his back, was unable to turn himself upon either side, and had to sit in a chair part of the night.

Cases like these are no rare exceptions. They are simply hidden under other names, such as neuritis, neurasthenia, nervous prostration, or chronic rheumatism. The reflex muscular spasms so subside in about a week after the application of the first cast, that the patient can stand in a more upright position, when a second cast can be applied. Three or four casts may be necessary before one can be put on with the patient standing erect. None of the plaster bandages on sale are at all suitable for casts of this kind. The plaster must be fresh and dry, and the bandages properly made, from crinoline of only certain grades, the glueing in the crinoline being partially or wholly washed out, in order to avoid using salt, which causes the cast to break easily. This brittleness must be avoided, as the patient cannot wear the cast continuously, and it must therefore be cut down the center in front, and laced, so the patient can frequently take it off. All the details of preparing plaster casts would take up so much time and space that I shall not attempt to bring the subject further into this paper. Leather and celluloid jackets follow the casts. The making of these is much more complicated than the making of the casts.

Osteo-arthritis of the hip closely resembles tuberculosis of this region. There is pain, swelling, tenderness, and inability to flex the thigh. But there is not the tubercular history, nor temperature, and upon making gentle motions, the thigh can be raised to a certain point without extreme pain; then it seems suddenly to strike some projection, the least motion then causing intense pain. X-rays show the head of the femur firmly imbedded in the acetabulum, the cotyloid



OSTEO-ARTHRITIS OF HIP. Head of femur imbedded in acetabulum.

day after application of the support, he sat up all day without difficulty. Another case, seen by me in Denver, during August of this year, had been unable to stand more than fifteen minutes without great pain, for over four years. His business necessitated his standing all the time he was at work. Inside of a month, he could attend to his business with less pain in six to eight hours work than he had had previously in a half hour, and, now, in less than three months, he has no pain in his back. He is also able to sleep all

ligament having bony deposit, and being, consequently, as stiff as the surrounding bone. Here the only relief is to cut off the imbedded head, chisel it out of the acetabulum, and have the patient walk with a hip splint. He can then easily walk with one cane, while before the operation he could only remain in bed, often suffering severe pain, and only walking, with the greatest difficulty, with two crutches.

In osteo-arthritis of the hands, the phalanges near the ends of the fingers are more often attacked. The outgrowths upon the bones of the hands, feet, or knees can be easily and positively diagnosed by means of the X-rays.

The history of chronic rheumatoid is very different from that of osteo arthritis. These are the cases that are most often diagnosed as chronic rheumatism. The tissues have been weakened from enormous doses of salicylates, instead of being strengthened with tissue-building tonics. Meats are cut off because they are supposed to increase the excess of lactic or uric acid, a theory which has been proved to be wholly mistaken. If tonics and increased nourishing diet had been given in the beginning, there would not be so many of these cases as there are at present. Finding themselves gradually getting worse, these patients finally drift into the hands of the various quacks, especially the Christian Scientists, or the osteopaths. I have here X-ray pictures of joints which will show how brutal it is to use the joints without regard to the diseased condition, and how extremely painful it must be to rub, or to attempt forcible correction. The cartilage is nearly all absorbed; many of the bones are hopelessly fused together, the nerves being so sensitive that anything like force greatly increases the painful condition. I have met a number who have resorted to a trial of osteopathy, in their desperation. Every one has stated that he could

not possibly stand the intense pain during manipulation, that the condition was much worse afterwards, and that it had to be given up after a few trials. The X-rays plainly show the reason.

This disease may attack only one joint, or, in extreme cases, every joint in the body, some patients being even unable to open the mouth, because of the jaw being involved. It may be brought on by mental as well as by physical conditions. Whether it is due to bacteria, or to faulty metabolism, is a disputed question. There is pain and swelling over the affected joints, and limited motion. On the surface of the cartilage there are soon formed erosions, the rubbing of which over each other causes the severe pain and the limited motion. In the long continued cases, the cartilage degenerates to such an extent that bone comes in contact with bone, and a true bony adhesion then occurs. This is plainly shown in some of the X-ray pictures, for some of which I am indebted to Drs. Goldthwait, Painter and Osgood, of Boston, and to Dr. H. W. Jones of St. Louis.

While there is swelling over the affected joints, often lasting a number of years, X-rays show that there is no increase of bone, and later on, the joint becomes smaller than normal, the skin presenting a shiny appearance. The bones become spongy, loaded with fat, and easily broken. X-rays show a less definite outline than with the osteo-arthritis.

It is surprising how many cases there are in this region who have reached a more or less advanced stage of this disease. These severe cases would not have reached this stage if they had been properly treated at first. As soon as the disease is recognized, they should be given the tonic line of treatment, meats and fresh air being especially indicated. Nourishment should also be given between meals. In fact, the same line of

general treatment should be followed that is prescribed in tuberculosis. Even the severe types can often be greatly helped by carrying out this general line of treatment. The painful joints should not be severely strained with exercise, but should be wrapped with moistened gauze, covered with rubber tissue. Going to hot springs has no medicinal value whatever. Any benefit comes only from the change of residence, and the possibly better sanitary surroundings, with probably more fresh air, and the better appetite induced by the change. If as much attention was paid at home to the drinking of good water, taking baths in any kind of a bathtub, and the keeping out of doors, there would not be the least additional benefit gained from drinking the water and bathing at any of the hot springs in existence, not to mention the useless loss of money and time.

Operative measures are often indicated. If the knee is much swollen and there is fluctuation, opening into the joint and letting out the excess of fluid, and taking out the fatty degenerated masses that will be found, often greatly improves this condition. Sometimes excision at the knee, or elbow, gives a stiff joint that is painless, and allows better use. Manipulation under an anesthetic, followed by a proper supporting apparatus, is often indicated, provided that the disease has not progressed so far that there is fusion of the bones. Steel soles, made over casts of the feet, often greatly assist to support weakened arches of the feet.

A peculiar feature of this disease is that after running a course of years, sometimes eight to ten years, or even more, the swelling and pain subside, and though the joints are more or less stiffened, the patient gets about much more comfortably than formerly, and gives to the medicine, or treatment last taken, the credit of the improvement.

I have a number of radiographs show-

ing the diseased condition of some of the numerous joints that may be affected. One shows beginning osteo-arthritis of the hands, two others show advanced rheumatoid arthritis of the hands, one of the latter taken by me from a patient who lives at Alamosa. The bones of the osteo-arthritic hand are more dense, while in the rheumatoid variety they are softer, allowing more of the surrounding soft parts to show up in the picture. I also show a picture of a normal hand, in order that the contrast, especially the lack of cartilage in the rheumatoid hand, may be observed. Osteo-arthritis of the hip shows the head of the femur firmly imbedded in the acetabulum. Osteo-arthritis of the spine, taken from a Denver patient, shows the irregular outlines of the vertebræ, and the deviation of the spinal column. Other pictures show different degrees of the two diseases in the knee, three of them of the osteo and three of them of the rheumatoid type.

Discussion.

Dr. Geo. B. Packard: I have been much interested in Dr. Leavitt's paper. It is a subject that I have been interested in for many years, but I feel that since reading the papers by Dr. Goldthwaite the last two or three years, I know a great deal more about the subject than before. While I do not know that I could say that there is no such thing as chronic rheumatism, I think it is very rare. Many of those cases of so-called chronic rheumatism are undoubtedly of a gouty nature, and nodules are seen later. Then relaxed joints, neuritis and other conditions are really present when we think we have a case of chronic rheumatism. I think it clears up the diagnosis in many of these old cases of chronic sciatica and lateral curvature developing in the adult, and other so-called functional affections of the spine.

Dr. John L. Porter, of Chicago: I have been much interested in this subject for the past three years. The increased knowledge which we have had in the last two or three years in regard to the pathology and symptomatology of these chronic bone inflammations has helped us very much to clear up our diagnosis. Since I have studied the subject

more thoroughly and have read Dr. Goldthwaite's papers, I can look back upon cases in which I failed to make a diagnosis, that now seem very clear.

Dr. Leavitt has said there is no such thing as "chronic rheumatism." I believe that there is a condition of chronic toxæmia which affects the joints, which does not produce either a destructive or proliferative inflammation; and if we have such a thing as chronic rheumatism it is of this type. We certainly see cases of chronic pain in the joints due to errors in living, errors in digestion, which can be stopped or completely cured by changing the patient's environment and changing their habits of living and their diet. Those cases are not cases where there is an increase in pain or decrease in pain by motion, or limitation of motion; but pain which the patient calls chronic rheumatism.

The next point is in regard to the pathology in these conditions. Rheumatoid arthritis, arthritis deformans and osteo-arthritis are terms that have been used indiscriminately by many to describe various chronic joint diseases which differ very much pathologically. What Goldthwaite has called osteo-arthritis is a true hyperplasia, an osteo-plasia, if I may coin that word, a hypertrophy or proliferative osteitis of the bony tissues about the joint, due to an irritative inflammation. Arthritis deformans, to my mind, brings up a clinical picture more like what we so frequently see in gouty individuals; deposits about the joint but not in the joint. Deposits of salts in the tissues surrounding a joint, but not a true increase in the bony parts that go to make up the tissues, such as we see in a true osteo-arthritis; and the term rheumatoid arthritis we limit to those destructive forms of joint inflammation, about the etiology of which we are ignorant, but which are not tubercular, and which occur in elderly people more than in young people and go on to a true destruction of the bone.

In regard to differential diagnosis, there is one point which Dr. Leavitt has not mentioned, which struck me pretty forcibly yesterday, when I had the opportunity of seeing a case with Dr. Packard in the County Hospital, of what I believe to be true osteo-arthritis of the left hip and spine. While in almost all other joint inflammations we find the soft tissues about the joint thickened and indurated, here the trouble was distinctly confined to the bony structures and there was an

atrophy and a soft, flaccid condition of the soft tissues which permitted the bony parts to be distinctively felt and outlined. The portions which you can pick up with your hands were distinctly enlarged, very much enlarged, and hard. But in distinction from a destructive inflammation, like tuberculosis, the muscles were atrophied; there was none of that thickening and induration of the soft tissues about the joint which occurs in other inflammatory diseases.

My experience agrees entirely with what Dr. Leavitt has said, that immobilization of the joints, and especially of the spine, gives the most marked relief. A case of osteo-arthritis of the spine, which was the most marked and the most perfect case I ever saw, came into my clinic a few months ago. The shoulders were movable, but the arms hung down in this position (indicating) because of flexion of the spine. The spine was perfectly rigid and bent to such an extent that the patient's line of vision was very much lowered. He had to lift his eyebrows constantly to see if there was anything ahead—to see where he was going. The ribs were ankylosed so firmly to the spine that breathing was entirely diaphragmatic and he could not expand his thorax one-fourth of an inch. He lived out of Chicago some distance, and I could only keep him in the city by putting him in the County Hospital; and I kept him there as long as the authorities would allow. During that time I put on a plaster jacket, under the best circumstances I could, and the spine was so painful on attempted extension that the jacket was put on with him on his hands and knees, with upward pressure under the chin. The plaster jacket enveloped the thorax and neck and lifted the chin as much as possible and at the same time extended the spine. Inside of forty-eight hours the pain had subsided, he was comfortable, the muscular spasm which had been constantly attempting to hold him up straight was relaxed and he was held up by the jacket. He has had two jackets since, and each one has succeeded in straightening up a little bit until the last time he came to the clinic he had gotten over this habit of constantly lifting his eyebrows in order to raise his field of vision.

It has occurred to me that in the immobilization of these joints, for instance such a joint as we saw yesterday, we might be favoring ankylosis while we are relieving the pain.

Now the referred pain, which Dr. Leavitt spoke of in his paper, was confined in this case to the sciatic nerve. He had a marked sciatica from the sciatic notch clear down to his heels, and I believe that the immobilization of the limb with a plaster-of-paris or some other splint extending well up on the trunk would relieve his sciatica. I am also inclined to believe that it might favor complete ankylosis. While he had but a little motion in the joint, he might lose it by immobilization.

There is one other point, and that is that in the tuberculous joint, when we try to make motion in that joint we expect a good deal of pain, especially in cases that are not more than six months to eighteen months old. But in cases of osteo-arthritis, while the motion is extremely limited, the attempted motion does not produce the pain that we get in the tuberculous joints.

CASES OF CONGENITAL DISLOCATION OF THE HIP.

BY GEO. B. PACKARD, M. D., DENVER.

Prior to 1902 the general profession took very little interest in the treatment of congenital dislocation of the hip; and the demonstrations made by Dr. Lorenz during that year in this country were looked upon by many physicians with a certain amount of reservation. But sufficient time has now elapsed to judge intelligently of these demonstrations. Of the six cases that I wish to report, four were operated upon by Dr. Lorenz and I made a preliminary report of them before the Orthopedic Association at the end of six months. One was operated upon by myself and one by Dr. E. J. Rogers and myself. Nearly one year has elapsed since the four were operated upon by Dr. Lorenz and the other two were operated respectively, eight and six months ago.

Case 1. Girl, aged 5 years. Posterior congenital dislocation of the right hip, trochanter elevated; $1\frac{3}{4}$ inch shortening, walks with a decided limp. Dislocation reduced by Dr. Lorenz, October 28, 1902. He pronounced the stability of the joint good after reduction and predicted

an excellent result. A plaster spica was applied with the thigh at right angles to the body and patient was able to walk in a few days. This dressing remained for six months when it was removed and an X-ray picture taken by Dr. Childs. The head of the bone was found to be in the acetabulum. The patient was then allowed to extend the leg as much as possible, bringing it into a position of about 45 degrees of abduction and in this position another spica bandage was applied. After an interval of a few weeks this dressing was removed and the leg brought down several degrees further. These dressings have been reapplied after an interval of a few weeks, and each time the leg brought nearer its normal position until September 27, when the spica was discontinued. Since that date the child has been running around without any dressing and the condition seems very satisfactory. The legs are of equal length, the motion is increasing. There is no atrophy of the muscles. There is some eversion of the foot, but this can be corrected if it remains permanent. The slight limp that is present is due to the restriction of motion, which is gradually diminishing; and habit, induced by plaster dressing.

Case 2. Male, aged 4 years. Posterior congenital dislocation of the hip with the usual symptoms; $1\frac{1}{4}$ inch shortening; walks with pronounced limp. Operated upon by Dr. Lorenz, October 28, 1902. Stability of joint not very good. Spica applied. Six months later it was removed and X-ray picture showed the head of the bone to be anterior, and below the anterior superior spine. The dressing was reapplied in nearly the same position.

Case 3. Girl, aged 4 years. The usual signs of dislocation present; $1\frac{1}{2}$ inch shortening. Reduction easily accomplished by Dr. Lorenz, October 28, 1902. He reported the stability very

poor. Slight adduction and flexion resulted in throwing the head of the bone out of the acetabulum. The usual dressing was applied and worn six months when an X-ray picture was taken by Dr. Childs, which showed an anterior transposition, the head being below the anterior superior spine of ilium. Spica was again applied in nearly the same position and allowed to remain four months. August 30 the leg was brought down about 45 degrees and another spica applied. Very little shortening is noticeable in these two cases of anterior transposition, and they walk very well. In both cases the head of the bone seems to be firmly held in its new position.

Case 4. Girl, aged 6 years. Usual symptoms with $1\frac{3}{4}$ inch shortening. This child had worn a brace for eighteen months, with perineal support which prevented weight bearing, and limited motion. As a result of this treatment there was marked atrophy of the muscles of the thigh and gluteal region. October 28, Dr. Lorenz reduced the dislocation with some difficulty, but after reduction pronounced the stability of the joint excellent and predicted a good result. At the end of six months an X-ray picture was taken and the head of the bone was in the acetabulum, which seemed well formed. The position of the leg was gradually brought down and the last dressing removed, September 24. Since that date she has been walking without splint. There is no shortening. Trochanter in proper position. Atrophy is present, but due to previous treatment. There is some stiffness, but it is gradually diminishing.

Case 5. Girl, aged 4. Left hip dislocation with $1\frac{1}{2}$ inch shortening. Trochanter elevated. Walks with a decided limp. With the assistance of Dr. Jaeger I reduced the dislocation January 26, 1903, and applied the spica bandage in the usual position. Renewed it July 28,

and the X-ray picture showed the head of the bone in the acetabulum, which seemed to be fairly well formed. The position being perfect at the end of six months, it is fair to presume that the outcome will be the same as cases 1 and 4, which seem to be perfect, nearly a year after the operation.

Case 6. Male, aged 8 years. Left dislocation; $1\frac{1}{2}$ inch shortening. Decided limp, joint rather rigid. This patient was seen by Dr. Lorenz, who advised preliminary extension before operation, on account of age and rigidity of joint. Extension was applied for several weeks when Dr. Rogers and myself attempted to reduce the dislocation. The joint was thoroughly relaxed in every direction. If an acetabulum existed it was so shallow that it could not be detected, or the contraction of the capsular ligament prevented us from getting the sensation of reduction. The head of the bone was therefore placed in the anterior position and spica bandage applied. The joint was very sensitive for several weeks; but the patient was able to walk with the aid of cane at the end of four weeks. The bandage was changed at the end of four months and the position of the leg changed sufficiently to enable him to walk more easily.

It will be observed that of the six cases here reported, at the present time, three seem to be good results, with head of the bone in the acetabulum and three are anterior transpositions, and in these cases the head of the bone seems to be firmly fixed against the pelvis, anteriorly, which will probably ensure good functional results.

Dr. Bradford, of Boston, who has made a very careful study of the resistance of tissues in the reduction of hip joint dislocation, in the past year, in both the operating room and anatomical room, reports that in the difficult cases the resistance from the strong tendon of the

adductor magnus is very great, not only to abduction, but also to pulling down the head. Cutting of this tendon, he has found to facilitate reduction to a marked degree, either before or at the time of operation. It would seem that this is a very important discovery, for, the inability to bring the head of the bone down to the level of the acetabulum, I believe is one of the main obstacles in the reduction of the older or more rigid cases.

Discussion.

Dr. Corwin: When Dr. Lorenz was good enough to spend a day with me he kindly operated upon two cases for me, one a single and the other a double dislocation. The single was a girl about four and one-half years of age. She recovered without any difficulty, with no shortening, no contractions, no deformity of any sort. With the double case one side was successful, the other was not so successful at first. It required a good deal of attention later, but is finally, I think, coming out all right. I had the opportunity of treating one case after Dr. Lorenz left. I had seen him do it so easily that I thought I could do it. I got it in, it has been in ever since, and the youngster is running around like some of Dr. Packard's cases.

It seems to me that with the cases that you can reduce at all you ought to succeed in most of them. But there will be some where the acetabulum or its rim is so shallow that it is impossible to get enough rim to build up to retain the head of the femur.

Dr. E. J. A. Rogers: I think that one feature that is impressed on us by these cases is the great difference in the anatomy in the different individual dislocations. We all know that in many of the cases that Dr. Lorenz handled he spoke of instability, but he did not explain to us exactly what this instability meant. From the X-ray pictures taken since he was here and from the manipulation of cases I think we have all come to understand that instability means practically the absence of an acetabulum. In Dr. Packard's report you notice in nearly all the cases in which Dr. Lorenz said there was instability the X-ray shows that the bone is not in an acetabulum. In the case of the older boy which Dr. Packard and I worked over so long and so hard, we both satisfied ourselves there was no acetabulum. The bone would slide backwards

and forwards over the surface of the ilium in exactly the location where there ought to have been some protuberance to mark a rim of an acetabulum, but the bone was practically smooth.

An interesting point in connection with this case is the fact that in this family there are three children all afflicted in the same way, one double and two single dislocations. Dr. Lorenz's great experience was shown in knowing in just what cases to attempt reduction and what cases not to touch. As soon as he handled a case he said at once, "this will be easily reduced," or "this will be very difficult in reduction," and his prognosis in almost every case proved absolutely true. But he did not explain to us exactly in what the difficulty lay. This has since been in part explained by the contraction of the adductors and the absence of an acetabulum.

Dr. J. L. Porter, of Chicago: The percentage of good results which Dr. Packard has shown here is larger than we have seen in larger groups of cases. Out of something like forty cases that Dr. Lorenz reduced in Chicago, twelve of fifteen have come under my observation since the casts were taken off; and of those not more than 25 per cent had the head of the femur in the acetabulum. About 50 per cent probably are anterior transpositions, and the rest have been very doubtful. From my observation I believe not over 25 per cent of the cases are true anatomical successes, i. e., the head of the bone put in the acetabulum and kept there. This small boy (Case II) has only had the second cast off two days, and the amount of outward rotation which he has is very noticeable. But that outward rotation very rapidly diminishes and probably the reason why the other cases seem to have less rotation is because the casts have been off longer, and they have been able to use the leg.

While Dr. Lorenz was very careful to select young cases and rejected some on account of their age, the age is not always a criterion as to the result of the operation. Shortly after Dr. Lorenz left Chicago, while he was here in Denver, I operated upon a ten-year-old case which he had refused to operate upon. Very much to my surprise, in about twenty minutes the dislocation was easily reduced. I said reduced—it was transposed; the acetabulum was so filled up that the head of the bone would not stay in, but it was transposed, and the girl of ten years of age is walking around

with the two legs of practically the same length.

I recently attempted a reduction in a case of six years of age, which Dr. Lorenz would have considered a very fortunate age, with the assistance of Dr. Ridlon, a much larger and more powerful man than I am; and we could not reduce the dislocation in any way. We could not find an acetabulum. We could not find any place to rest the head of the femur and we had to give it up.

There is one obstacle to reduction besides the age of the patient and the shortness of the muscles and the shortness of the tendons, which we have learned is apt to be a very powerful obstacle, and that is the presence of a ligamentum teres. In one case which has been investigated post-mortem in Philadelphia, that Dr. Lorenz attempted to reduce, the ligamentum teres appeared over four inches in length, and was found curled up in front of the head of the femur and pushed into what ought to have been an acetabulum, that is, a small depression in the os innominata. There was a small acetabulum there, but the ligamentum teres was so long and so voluminous that it would not permit the head of the femur to go in.

I believe personally that these cases which Dr. Packard has shown us are perfect recoveries functionally. In these cases that are not anatomical reductions, while the head of the femur does not go into the acetabulum, if it is transposed anteriorly and finds a good resting place under the anterior-superior spine, or even so far forward as the femoral artery, and some of them do lie under the femoral artery and nerve; these cases are good functional results in that they lengthen the leg, they give the patient a better gait, and they do away with the lordosis, which is such a deformity as the patient grows older. In the cases that come to us 18 to 20 years of age, and especially with a double dislocation, the lordosis is so marked that it constitutes a very important part of the deformity.

Dr. Leavitt: I happened to see Dr. Lorenz in Boston last year in nearly half a dozen cases, and he did some very interesting work there. I found that they had been operating in this same class of cases and practically the same manner ever since 1895; and had reduced, before he came there, a good many cases. The criticism was a good deal as Dr. Porter says, in relation to his selected cases, and he selected one case of a boy ten years old which he attempted and worked very hard

to operate upon. It was called a bloodless operation, but the amount of blood which was evidently upon the inside and under the tissues was quite large, and the criticism made by the orthopedists there was; if he had cut the adductor muscle and combined that with his blood-less method he would probably have gotten better results than he did, although he did remarkably well. The success which they have had there, and which they consider Dr. Lorenz had, averaged from 20 to 30 per cent. cures. Certainly the cases here which Dr. Packard has shown are as good results as could be obtained anywhere.

Dr. Powers: I would express my own appreciation of the careful and thorough after-treatment which Dr. Packard has given these cases. On that depends in large part the ultimate result. The careful thoughtfulness which Dr. Packard has given these cases is to my mind quite as much responsible as the original management. I had the pleasure of seeing Dr. Packard do one of these at St. Luke's Hospital, and it seemed to me that while we all profited by the remarkable visit of Dr. Lorenz, that Dr. Packard succeeded as quickly and as easily as the distinguished Austrian himself.

Dr. Driscoll: It was my fortune to be in Chicago when Dr. Lorenz was there and I witnessed twenty-six of his operations, including operations on wry-neck and such deformities other than hip-joint diseases. Until that time I did not think it possible for any human being to withstand the great exertion and physical force that was exerted by Dr. Lorenz in a re-adjustment of this hip-joint dislocation. I wish to congratulate the profession in Colorado and in Denver upon the splendid success that Dr. Packard has had in these cases. I believe it is the vigilance that Dr. Packard has manifested in their treatment that has brought them out so admirably. If he continues with the same vigilance that he has exhibited, he will have a greater per cent of successes than was reported from Chicago.

INCIPIENT AND ACUTE INSANE. —RECOVERABILITY AND THE FACTORS THEREIN.

J. E. COURTNEY, M. D., DENVER.

I do not pretend to have anything distinctly new, but simply want to present and review a few facts in regard to the recoverable insane, which I believe estab-

lished, which at least have been impressed upon me by a somewhat large experience. The tremendous importance of the subject is attested by the frequency of insanity; about one in every three hundred of the population in America and England, and nearly one to every two hundred in Ireland. New York state alone shows nearly 26,000 registered insane in a population of seven and a quarter millions, one in about every 280 of the population. The class of the insane in which recovery pertains in a high degree is very limited; the time also, three to six months, in which cure must be accomplished is short. Psychiatry and neurology are now jointly directing much attention towards the earlier and earlier recognition and treatment of this class.

INCIPIENT AND ACUTE CASES.

By incipient in this connection I mean those effects of physical and psychical causes to which any one may be subjected, but which in individual cases produce especially disorder of the brain, so that mental symptoms are the prominent symptoms, but not yet so pronounced as to constitute certifiable insanity. For example: The depression and foreboding preceding actual melancholia, antedating delusions of self-abasement or of threatened disaster, drug and alcohol habitism with hallucinations and delusions, which can as yet be corrected; hysteria and neurasthenia, if insanity is developed, are for varying periods before in its incipency, the fact being frequently recognized in retrospect. The recognition of this incipient stage, as distinguished from developed insanity, in which appear confusion, hallucination and delusion, on which insanity may be so surely predicted as to warrant physicians, family and jury, in taking the step of formal commitment is most important.

The last report of the Massachusetts Board of Lunacy says: "Patients are

constantly coming to notice during the incipient stage of mental disorder, who might never have to enter an insane hospital if they could obtain relief from unusual stress, or be removed from unfavorable environment, or have the advice and supervision which might be afforded through the out-patient department of a hospital."

PATHOLOGY.

But little is positively known as yet of the true pathology of these cases. We say there are spasms of cerebral vessels with anemias, pareses of vessels with hyperemia and œdema, but these phenomena may exist without disease of mind. This very sparsity of pathological data has led to various theories regarding the conduct of the brain elements, the neurons. For example: The retraction theory, the protrusion and retraction of the nerve processes, thus making and breaking the circuits, and so regulating an interrupting consciousness. But this seems too roughly mechanical. It appeals to us more, following Loeb's suggestions, to think of the brain cells as electrochemical units and the cell processes as connecting wires, so to speak.

Observers have found tumefactions of the projections of the cortical cells, retraction or loss of branches; yet these are really gross changes, and have mostly been experimental findings in animals, and the mental condition of the animals, confusion, lethargy, corresponded to terminal rather than recoverable phases of insanity in man. Thus, the classifications of insanity are still symptomatic of the mental condition rather than the pathological state of the brain.

It appears that the divisions of insanity should be more a matter of phases than of forms. This is the tendency. There have been as many as thirty divisions of melancholia made. A recent work of Berkley of Johns Hopkins gives only

five. In the recoverable cases, the lesions, if visible by any means, must be extremely fine and difficult to separate from post mortem changes and artifacts. Pathology here, as function, must be more subtle and elusive than in a secreting or excreting organ; certainly it is not definitely known.

As to the non-recoverable insane, there is abundant pathology; thickenings and density of the cranial bones, adhesion of the dura, milky cloudiness and thickenings of the pia, interrupted gelatinous deposits along the course of pial vessels, causing the familiar sago grain appearance; extravasations of blood, or the stains left after absorption, adhesions between the pia and cortex; atrophy of the convolutions and excess of cerebro spinal fluid. These are the oft repeated recordings on the autopsy blanks of the large asylums. But these phenomena belong to the terminal states of insanity, more or less promiscuously found, and not appearing in groupings positively characteristic of particular forms of insanity, except perhaps the so-called worm-eaten appearance of the cortex on removal of the pia in general paresis.

The diseased conditions of the cerebral arteries are very well understood, but these also belong to the grosser lesions. The heavy annual mortality in the insane, one in ten as against one in fifty and over, of the general population, is made up largely of cases in the terminal phases of the disease.

THE RECOVERABLE CLASS.

The recoverable class of the insane then is very small, to wit: Incipient cases, melancholia in its simple and acute stages, acute mania; the temporary dementia which at times appears in the course of these, and a few cases of apparent acute dementia. Now in this select class the recovery rate is very high, 75 per cent or better.

FACTORS IN RECOVERY.

The most important factor then for recovery is the earliest possible recognition and treatment of these cases. There is evidence enough of the harmfulness of delay and the rapid diminution of prospect of recovery. The statistics of institutions are so uniform on these points that correctness of observation cannot be doubted. The percentage of recovery in the types of insanity I have outlined, in which the attack has existed three months and less, is upwards of 50 per cent of all the recoveries, and after a duration of six months previous to admission, the recovery rate falls rapidly.

Likewise a review of the period under treatment of those that recover show upwards of 50 per cent, doing so in six months and less; when recovery does not occur in six months the prospect shrinks more than 50 per cent. In few medical or surgical diseases is the risk of chronicity so great; in none so disastrous.

At the Binghampton State Hospital of New York for 1902, of the 55 recovered, 22 were insane less than a month; 44 less than six months, and 47 of these 55 recoveries were under treatment less than one year.

The Massachusetts State Board of Lunacy, in its report for 1900, takes a most pessimistic view. It rates as curable only 317 in a total of nearly 7,000, under treatment in the state, less than 7 per cent. The biennial report of the Colorado State Insane Asylum for 1901 and 1902 shows 49 recoveries in a population of a little over 500. One-half of these were under treatment less than five months. In this same period there were admitted 50 persons in which the attack had existed six months and under. The much more frequent admission of insane to general hospitals, the more liberal laws for voluntary commitments and temporary detention, are recognitions of the supreme importance of early treatment.

In 1900, at the McLean Hospital, the Department for Insane of the Massachusetts General Hospital at Boston, 84 of the 165 admitted, more than half, were voluntary commitments. There are such strong reasons for hesitating to announce the diagnosis, if made early; the risk of offense to the family, and the popular dread of any mental disorder, that one would do well to send his patient to a near-by hospital for observation before declaring what he fears is the true condition. A case must be so advanced as to be clear to almost any one before a formal certification or hearing by jury, which pertains in some states, can be gone through with.

TREATMENT.

As to medical treatment, while not by any means a therapeutic nihilist, there are certainly no specifics in any of these conditions. Nursing, management, good food, congenial, hopeful surroundings, are of more importance than medicine alone. The functional disorders of the higher centers affect consciousness; the sense of relationship, the adjustment to the outer world; and psychical and physiological measures are important.

A classified list of measures as adapted to any particular train of symptoms is of course out of the question. The tried hypnotics and sedatives, the hot bath, prolonged, liberal feeding, and tonics and stimulants on occasion must be the basis. While there is no magic in the care given by asylums and Homes for these cases, yet, the facilities and understanding of the nature of these cases are better than can be immediately commanded in the home, let alone the question of expense. Nothing can take the place of the personal comprehending care of these cases. It is inhibiting to the excited, reassuring to the depressed, of control and order in the objective world, however chaotic the subjective may seem.

This explains the quieting effect sometimes seen in the mere removal of the patient from home where there was more or less harmful yielding to, and sharing of, the mental state of the patient, confirming false impressions; but when brought where fears or excitement did not disturb those about him it has acted as a potent sedative.

In recent years earlier commitment does pertain. Twenty years ago the number of cases diagnosed on admission as acute mania, almost doubled those diagnosed as acute melancholia; now this is almost reversed. For example, of the 12,000 admitted to the Department for Insane of the Pennsylvania Hospital at Philadelphia, since 1841, 4,500, about equally divided between men and women, were rated acute mania; this is some 37 per cent; 3,300 acute melancholia, only 27 per cent, but for the year 1902, only 24 in 185 admissions, or 13 per cent, were rated acute mania, and 64, or 34 per cent, acute melancholia.

It is not probable that insanity runs so much more to the depressive states, but this is a result of getting the patient under treatment, or at least making the diagnosis in the premania or early depressed stage which pertains in many cases and the prevention of the development of mania. Individual segregate care offers great advantages over aggregation in large wards, especially where there are chronic cases, for, while the patient may fail to see anything irregular in his own ideas or conduct, he will see it fast enough in another.

Dr. Wagner, superintendent of the Binghampton State Hospital of New York, with a population of about 1,400, and annual admission of some 250, says: "The need of a building for acute cases has been felt for several years. We are receiving patients suffering from acute attacks of mental derangement, who ought to get well, but who, in some instances at

least, I believe, fail to recover because it is impossible for us, under existing conditions, to provide them with the care they should have."

The Massachusetts State Board of Lunacy, referring to curable cases, says: "To such, aggregation in large numbers is most detrimental. A small hospital for acute cases for 50 patients should be erected in connection with each hospital, but sufficiently distant therefrom. Early efficient treatment of acute curable insane puts the most effectual check upon increase of insanity, because thus the largest number may be restored to sanity, brain damage minimized, and its remote consequences through heredity ameliorated."

Dr. Busey, superintendent of the Colorado Insane Asylum, in his last report says of treating these acute cases: "Individualized treatment and personal liberty go to make up the fundamental principles."

As it is often necessary for the proper treatment of insanity, let alone the matter of public safety, to restrict personal liberty, there must be laws regulating the methods of imposing such restrictions. This publicity and formality imply that insanity is an offense against the law and not a sickness in the proper sense.

I believe that we and our nurses must learn more thoroughly its prodromes; the incipient stages of insanity, the necessity of the earliest possible diagnosis and effort to cure; and that hospitals must be as liberal in admitting such cases as they would any form of illness.

The last report of the State Board of Lunacy of New York says: "A hospital for acute insane should be located as general hospitals in the most populous portions of the city. It should have an outdoor department where mental cases may be seen in the very early stages. Patients should be received for diagnosis as emergency cases without commitment

papers, legal forms to be made use of only after a specified time has elapsed and when it becomes evident detention will be necessary."

THE TREATMENT OF NEURASTHENIA

BY HOWELL T. PERSHING, M. D.,
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There is one fundamental principle which furnishes the reason for every step in the treatment of a neurasthenic patient. The nervous system is a mechanism and, like the simplest machine, it receives a limited amount of energy and expends it. Under normal conditions the amount of energy received has slightly exceeded the amount expended, so that a certain reserve has been accumulated, more or less of which will be used during periods of unusual activity to be promptly restored during rest. An exhausted nervous system has been so excessively active that food and oxygen have not been able to restore the depleted reserve and so, whenever a vigorous action is called for, the machine works badly. It is like a storage battery that has been discharged too rapidly or for too long a time. Accordingly, whatever tends either to check the loss of nervous energy or to increase its income, providing it is not incidentally harmful, is a remedy for neurasthenia.

But, although this principle is clear and simple, its application is generally difficult and intricate. Increase in food and oxygen is indicated but the increase may not be utilized. An over-exhausted storage battery is so impaired that it cannot at once receive a full charge of electricity, and an exhausted nervous system may fail both to control digestion and to assimilate what is digested and brought to it. Rest is plainly indicated, but the most stringent abstention from work will be of little or no avail if the more exhausting process of fear or worry is al-

lowed to go on. Accordingly, we have no specific for neurasthenia; there is no magic drug or food, no form of electricity or radial activity, no plan of rest and isolation, no system of mental therapeutics on which we may exclusively rely.

When a difficult thing is to be done there is generally a special combination of resources that will succeed, although each taken singly is futile. To open the door of a safe you must have the right figures rightly arranged, and to get more than an occasional success in treating neurasthenia we must have a combination of favorable influences especially adapted to each individual patient. Theoretically, the combination should be determined by the condition and individual peculiarities of the patient alone, but the physician is also a person with his own peculiar resources and limitations, and the treatment must to a great extent be determined by his own characteristics. For example, the physician who is buoyant and optimistic will depend largely on the favorable mental influence he exerts, while the one whose chief characteristic is scientific accuracy will depend on the physical side of treatment and only secondarily exert a favorable mental influence. Just as no two artists can portray the same person in the same way, so no two physicians can treat the same case of neurasthenia in the same way.

In accord with the fundamental principle we should attempt to divide all remedies into those which, like rest, diminish the expenditure of nervous energy and those which, like food, increase its income. This can be done only roughly, for some remedies are helpful in both ways, and others, like electricity, are known to be useful but in ways that are indirect and obscure. Making these allowances, our resources may be tabulated as follows:

I. Remedies whose chief effect is to prevent the loss of nervous energy.

A. Prevention of emotional disturbances.

1. By reassurance and favorable suggestion.

2. By forming the habit of muscular relaxation and repose.

B. Limitation of work.

C. Prevention of toxic conditions.

D. Removal of peripheral irritations.

E. Reduction of cortical irritability by medicines.

F. Sleep.

II. Remedies whose chief effect is to increase the income of nervous energy.

A. Food.

B. Medicines.

III. Remedies used empirically whose action is complex or obscure: Electricity, Hydrotherapy, Massage, Exercise.

Emotional disturbances cause the most serious loss of energy in most cases of neurasthenia. Beside the ordinary griefs, anxieties and vexations which may come to any one, the neurasthenic has a great many which a normal person cannot understand. There is a long list of diseases, ranging from varicocele to insanity, one or more of which he imagines to be fastening itself upon him. Experiences of the most ordinary kind, such as the purchase of a ticket, getting on a car, walking in the street, talking with an acquaintance, and so on, may cause attacks of fear resembling stage fright. An accidental association of ideas, as when the sight of a knife suggests the idea of stabbing a child, may arouse such an intensity of horror as to fix the dreadful act in mind. The inevitable annoyances of life have an exaggerated effect upon the neurasthenic and he reacts excessively to a large number of trifling irritations which a normal person would scarcely notice at all; under their influence there is a tendency to assume a strained attitude in which the breathing is rapid or irregular and the muscles generally are

tense. This condition is a very exhausting one; patients often say that they do their best to hold their nervousness in but finally go to pieces. In these and many other ways the disordered emotions drain the patient's strength and prevent its restoration.

The treatment of these disturbances begins with the examination and prognosis. Skillful questions and the careful physical examination convince the patient that his mysterious disease is understood, and the assurance that the case is one of nervous fatigue, that there is no organic disease, no sexual disorder, no danger of insanity, etc., and that the annoying symptoms will no doubt disappear under proper treatment, at once places him on a higher emotional plane. Fear and depression thus banished will no doubt return, but the skillful repetition of the reassurance with appropriate variations will again succeed and for a longer time.

But, although it is of great importance to remove the ideas which might rationally cause a depressing emotion, this is not sufficient, for such emotions often persist without any rational cause. The neurasthenic knows very well that an inappropriate question ought not to irritate him, yet it may set off an explosion of anger; he knows there is nothing to fear, yet feels horribly afraid. A very valuable resource in controlling a depressing emotion consists in the voluntary suppression of its motor reaction and the imitation of the attitudes and actions which express the opposite emotion. Thus the school-boy about to declaim, who would like to sink through the stage, steadies his trembling limbs, holds himself erect and forces loud tones from his quavering larynx; and in doing so he does not merely conceal his fear, he to a great extent dispels it by replacing the sensations of fear with the sensations of courage. Every neurasthenic should be taught to treat his fears, rational and irrational, in

the same way. Too much should not be expected of this artificial courage at first, but if judiciously cultivated it will rapidly develop power for good. On the same principle, the neurasthenic should be taught to avoid the motor reaction to small annoyances and anxieties by breathing easily and slowly, by relaxing all his muscles except those whose activity is really needed, by speaking calmly, in short by assuming the attitude and expression of complete serenity and repose.

The prohibition of work is an obvious remedy for neurasthenia, altogether too obvious, for it has great disadvantages and is often used to no purpose. The physician must carefully consider the relative importance of work and worry and to what extent one is dependent on the other. It is very easy to tell a patient that he must drop everything and get away, but this is often a shirking of responsibility. In many cases it is far wiser to keep the patient doing a reasonable amount of work and enable him to do it by removing, as far as possible, all other causes of exhaustion. There are many other cases, however, especially those in which work has been a large factor in causing exhaustion or is inseparable from worry, that require the patient to give up work completely for a time, and unless he is to stay in bed the rest must be combined with agreeable recreation. It goes without saying that short hours for work and many vacations are eminently desirable, but it is even more important that the patient should learn not to think of his cares and perplexities in the hours that ought to be devoted to rest or recreation. Everyone should cultivate a sport or hobby of some kind with which to crowd out inopportune thoughts.

In my experience the so-called uric acid diathesis is a very frequent complication of neurasthenia, and much benefit is derived from treating it with an abund-

ance of water and some compound of salicylic acid. Intestinal indigestion is also a frequent complication, and although it is generally secondary to the nervous disturbance it should be palliated by appropriate nitrogenous diet, antiseptics (particularly salol) and mild laxatives. Purgation is very badly borne by neurasthenics. The excessive use of alcohol can only increase the degree of nervous exhaustion if it does not lead to graver forms of disease. Theoretically the use of a strictly limited quantity, taken with food, might be beneficial, but in practice it is so difficult to secure the proper dosage that total abstinence is by far the best rule. The moderate use of tobacco is less likely to be harmful and may often be allowed. Neurasthenics, however, are especially sensitive to it, and in some cases it must be given up altogether.

The pain and annoyance due to disease in any part of the body may be a contributory cause of neurasthenia. Such local diseases should always be treated, but their importance should not be magnified and all severe measures should be avoided or at least postponed. The most important sources of peripheral irritation are disease of the intestines, pelvic diseases of women, eye-strain, disease of the ear, causing pain or tinnitus, disease of the bladder and disease of the anus.

In most cases the patient has become so sensitive to all unfavorable influences that even when shielded from them to the utmost possible extent they still annoy and exhaust him. Under these circumstances it is eminently desirable that the irritable weakness of the cerebral cortex should be reduced and many physicians try to do this by means of bromides. My own belief is that bromides continued for any length of time in efficient doses depress the nervous system and aggravate rather than alleviate the disease. Codeine in doses of $\frac{1}{4}$ to $\frac{1}{2}$ a grain three or four

times daily acts far more happily and helps toward a permanent cure. Opium in small doses, $\frac{1}{12}$ to $\frac{1}{4}$ of a grain of the extract, is still more useful, but in prescribing it the possible danger of the opium habit must always be taken into account. It should always be in combination with other remedies, such as strychnia and laxatives to be taken only at definite times, so that the patient will have no discretion as to the size or frequency of the dose and would get into trouble at once if he exceeded directions. This simple expedient is a most efficient safeguard and removes almost all of the danger. The patient should not know the ingredients of his prescription and should be advised not to read it, on the general ground that attention to the remedies fixes attention on the symptoms. Opium is especially valuable in cases of morbid fear, in which its value generally far outweighs the possible danger, and in those in which the recurrence of an agonizing idea threatens the patient's sanity. In the latter it is indispensable. Unless the physician is confident that the symptoms are serious enough to call for an opiate and is confident of his ability to use it carefully and skillfully he ought to withhold it, but the disease is so serious and so obstinate that we cannot afford to discard so useful a remedy.

Neurasthenics should sleep as much as they can. If insomnia is troublesome at first it often yields to the combination of remedies chosen without requiring the use of a direct hypnotic, which should always be avoided if possible. When wakefulness becomes a serious matter chloral is generally the best hypnotic; it is more efficient and less likely to cause depression of spirits next day than either sulphonal or trional. It should be omitted every second or third night and altogether discontinued as soon as possible.

Having reduced the waste of nervous energy to a minimum, it will be much

easier to increase its supply than if the latter alone were attempted.

The essentials in regard to food are that it should be abundant and taken at short intervals, that it should be rich in nitrogenous and phosphorized articles, such as meat and eggs, and that it should be digested. All theories about the stomach needing a rest must be ignored; it is the nervous system that must be rested and the digestive organs must be made to do their work. Anxious attention to diet does nothing but harm and digestive ferments seem to me to be altogether useless. On the other hand, strychnia, small doses of calomel and intestinal antiseptics are often of great service, but the main thing is that the patient should eat without fear. The weight should be recorded from time to time and its increase is a most valuable exhilarant for the patient.

Many attempts have been made to supply nervous energy through drugs, on the whole with very little success. Phosphorus, phosphide of zinc and the hypophosphites I long ago discarded because they never seemed to be of the slightest use and the first two were generally distinctly harmful. The glycerophosphates I have never tried, believing that if they are really useful the phosphorus compounds of eggs and meat are still better.

Strychnia probably stimulates the nutritive processes of the nerve cells, and it seems to me to lessen the irritable weakness which is so characteristic of neurasthenia. Arsenic in its older irritating forms is more likely to do harm than good; in the form of cacodylate of sodium it may be given much more freely and is especially indicated, with iron, in anæmic cases. It is probably useful in other cases but I find it hard to be sure. All neurasthenics are apt to infer from their bad feelings that their medicine is disagreeing with them, and if the physician makes many changes on this account his useful-

ness will soon be at an end. In the early part of the treatment it is very important to prescribe for only a very few days in advance, and only the safest drugs in small doses, and then insist that all be taken in spite of the patient's fancies. After confidence has been established one may prescribe much more boldly.

Such remedies as electricity, hydrotherapy, massage, exercise and change of climate I place last, because I regard them as decidedly least in importance. Any or all of them may be used to advantage, especially for their psychic effect, as adjuvants to a combination of the remedies already mentioned, but it is a great mistake to exalt any of them into a chief place.

The real difficulty in treating neurasthenia is not to know the remedies that may be used, but to select and make effective that combination which best suits the particular patient, taking into consideration all his circumstances as well as the features of his disease. This problem the physician must approach in the spirit of an artist rather than in that of a pure scientist. He must select and emphasize some resources and ignore others. For some patients he will choose the combination devised by Weir Mitchell and known as the rest cure. But if he does not have some of that great man's success in happily influencing the patient's mind the rest, food, electricity and massage will do but little good and may even make matters worse. His greatest skill will be demanded by those who are not financially able to command the luxuries of the rest cure, who must continue at their work or return to it at the earliest possible moment and yet must recover their health.

Discussion.

Dr. Oettinger: Dr. Pershing has in a very interesting way presented this subject to us. He makes paramount the fact that we must individualize in treating neurasthenia. I would

like to ask him, as I would like to know the experience of many practitioners who are present and who call to mind their cases of chronic neurasthenia, to tell me in how many cases they obtain permanent and satisfactory results. As far as I am concerned, I would almost as lief treat a chronic case of epilepsy as to treat a chronic case of neurasthenia. I have, in both instances, obtained quite unsatisfactory results. It is true that in some cases of chronic neurasthenia the patient will be better for reasons the doctor knows little about. There is a change in the metabolism of the body which he knows little of and can control only in very slight measure because of that fact.

In my opinion the future success in the treatment of neurasthenia, in the more important neural scleroses and in many of the metabolic diseases must be more rational and more specific, because I believe in these classes of diseases we have to do with a change in the body ferments. Science has disclosed the fact that in bacterial diseases it is not, as a rule, the mere fact of the presence of the bacteria which does harm nor the absorption of them after they are dead, but that in most cases it is the absorption of the bacterial toxins which they elaborate. So in non-bacterial metabolic diseases I believe that morbidity largely arises from a change in the tissue ferments—from toxic enzymes arising from a perverted body cell. Herein the body might be harmed in two ways at least; first, by the enzymes themselves which probably attack the tissues and lead thus to sclerosis, and again by the absorption of their toxic products. Thus cholin, which is always found in degenerated nerve tissues, is a basic product, comparatively innocuous in itself, though some of its oxidation forms, such as neurine and muscarine, are highly poisonous. So I believe our efforts must be directed toward neutralizing the toxins of intermediate products of digestion, toward further oxidation of the proteid molecule, where digestion is only partly effected, and, last, but not least, toward obtaining specific serums to neutralize toxic cell enzymes where these be present.

Dr. Pershing: As to the results of treatment: In my practice for some fourteen or fifteen years the results have been generally favorable. Most of the patients get practically well and remain so or have only slight relapses. The results become progressively unfavorable the longer the disease has lasted.

Most of the cases that I see have not lasted

a very great time, so cannot be called chronic cases of neurasthenia. Some of the old cases are about as discouraging as any disease that one can treat. The average case of neurasthenia, however, I think is a very pleasant one to treat for a physician who has special skill in that line.

Now as to the cause of neurasthenia: Dr. Oettinger makes a very interesting suggestion, which seems to be in the air just now, and that is that the enzymes or ferments of the body become disordered and that this is the secret of the faulty metabolism. That may be so, but it has not as yet given us any light for treatment because we do not know the toxine, if there is a toxine, that is produced, nor do we know what organ is at fault. We generally have practically a case of extreme fatigue in which the patient cannot get properly rested in the ordinary way, and the problem is to see that he does get rested, that is, that the storage cells become recharged and regain their efficiency. It may easily be that in a few years we will have much more precise knowledge and that our treatment will be more specific than it now is. My own experience has convinced me of the great importance of the mental condition of the neurasthenic, of relieving the emotional disturbance. If that is not done all the rest will probably be unavailing; and if this is done, other things, while they are important, may be allowed to have a more or less subordinate position.

TETANUS CURED BY INJECTING ANTI-TETANIC SERUM INTO THE BRAIN.

I. B. PERKINS, M. D., DENVER.

E. F., a boy 10 years of age, while playing with a toy pistol on July 4 last, exploded a blank cartridge, the wad of which took effect in the palm of the left hand, inflicting a somewhat lacerated wound and burying itself deeply in the tissues. He was taken to the police station, where the wound was dressed and subsequently cared for until it had entirely healed.

On the 23d of July, 19 days after the injury, I saw him in consultation with Dr. A. A. Clough, who had just been called into the case. Marked trismus was

present. During the clonic spasms which came at short intervals, the jaws would set tightly together. The posterior muscles of the neck as well as the muscles of the back would become rigid and the boy appeared to experience great pain. In the interval between the spasmodic attacks the muscles of the jaws were not so rigid, but they did not relax sufficiently to allow the jaws to be separated. The muscles of the neck and back relaxed slightly in the interval, but contracted instantly on the approach of the spasms, drawing the head firmly backward.

Tetanus was diagnosed, and immediate operation was decided upon. While on the way to the hospital slight jars of the vehicle caused several severe spasmodic attacks. Several physicians saw him at the hospital and verified the diagnosis. While being anesthetized and after he was unconscious of his surroundings the rigidity of the muscles remained and the jaws could not be separated until he was completely anesthetized. When coming out of the anesthesia the trismus returned and was quite marked before return of consciousness. The entire head was shaved and carefully cleansed. Roux's point was selected for injecting the serum into the brain-substance. This is a point half way between the outer angle of the orbit and a point on the vertex at a junction of a line crossing over between the two auditory canals. The patient being right-handed, the right side was selected. A horseshoe shaped flap one inch in diameter was made, with the open portion of the shoe directed toward the temple. The periosteum was lifted with the flap, and a trephine button one-fourth inch in diameter was removed. The needle of the syringe was introduced into the brain substance to a depth of two inches with the point directed forward and toward the median line, and ten cc. of anti-tetanic serum was slowly injected during the withdrawal of the needle. Ten more cc.

of the serum were injected in the same manner with the point of the needle directed forward and downward and not toward the median line. Before injecting the serum the dura was pierced with a bistoury so that sufficient fluid might escape to compensate for the serum which was introduced, so that paralysis from pressure would be thereby averted. The tissue flap was then sutured in position. The button of bone was not replaced.

An incision was made in the hand at the point of injury and several small pieces of the wadding were removed.

Reaction following the operation was prompt and although the trismus returned on the return of consciousness, the spasms were not nearly so severe and subsided altogether after forty-eight hours.

Immediately following operation, sodium bromide gr. X and chloral hydrate gr. V were given by enema. This was repeated at varying intervals for several days, and then small doses of the bromide and chloral were given by mouth, sufficient being used to keep the patient sleeping most of the time. The temperature was 99° F. at the time of operation and did not go above 99½° at any time. The highest rate of pulse was 108.

There was some stiffness of the limbs on first attempting to walk, which was two weeks after operation. This was not more marked on one side than on the other and disappeared in a few days. At this time the patient appears to be in a perfectly normal condition, having made a complete recovery.

The literature on this subject is not very plentiful and is confined almost entirely to the journals. *The Annals of Surgery*, March, 1900, contains a very instructive article written by Dr. Robert Abbe, and in the April number, 1899, of the same journal, Dr. Lewis S. Pilcher has reviewed the subject in a very interesting and instructive manner. In most of the cases reported subcutaneous or

intra-venous injections of the serum have been given either before or after the intracerebral treatment, making it impossible to determine the value of either method. In my case a larger dose was given than has usually been tried and this one dose was the only serum administered.

In conclusion I wish to call attention to the necessity of freely incising, cleaning out and openly treating, at the first dressing, all blank cartridge wounds. Otherwise portions of the wadding are very apt to be retained, and wounds produced by wads from blank cartridges appear to develop tetanus much more frequently than do those produced by bullets.

Discussion.

Dr. S. D. Hopkins: I am much interested in the case reported. Dr. C. B. Lyman and myself injected into the right frontal lobe of the brain 20 c. c. of antitetanic serum in a case of tetanus, with recovery. The patient was 21 years of age, and presented himself at the Denver County Hospital three days after infection took place. There was marked trismus, convulsions occurred every 10 or 15 minutes without any disturbance in consciousness. While under the influence of the anesthetic he had several convulsions. After recovering from the effects of the anaesthetic he had a number of convulsions, and in the course of forty-eight hours he was entirely free from them. He made a complete recovery and was discharged from the hospital fourteen days after the operation.

Roux has experimented with the serum on guinea pigs. He tetanized forty-five guinea pigs and saved thirty-five of this number by the intracerebral method, while only two out of the seventeen were saved by the subcutaneous method. Examination of the brain in those cases in which an autopsy was held showed that death was either due to a meningitis or a cerebral abscess.

IMPERFORATE ANUS WITH VULVAR OPENING.

By WALTER A. JAYNE, M. D., DENVER.

Congenital malformation of the rectum and anus occurs with great rarity in the experience of the general practitioner and

but seldom in the practice of the surgeon. The importance of its successful treatment to the comfort and future welfare of the individual, its frequent fatality, the novel surgical problems, often of extreme difficulty, offered for solution, renders this condition one of interest to the practitioner and surgeon alike.

Authorities differ widely in their estimate of the frequency of these malformations. One states that it occurs in a proportion of one in every two thousand births, another, one in forty-five hundred, and still another one in ten thousand births. The anatomical conditions found vary greatly. Bodenhamer has offered a classification of these malformations which is complete and has proven generally acceptable. He divides them under nine headings, as follows:

1. Stenosis of the anus or rectum.
2. Occlusion by a membranous diaphragm.
3. Absence of the anus, the rectal pouch terminating at a greater or less distance from the perinæum.
4. The rectum ending in a blind pouch, the anus being present.
5. Absence of the anus, the rectum opening at some abnormal point in the perinæum or sacral region.
6. Absence of anus, the rectal pouch opening into one of the genital or urinary organs.
7. One or another of the genital or urinary organs opening into the rectum.
8. Total absence of the rectum.
9. Absence of the large intestine.

This whole subject is one which might well occupy our attention but I desire now to specialize; and in reporting a case under the sixth heading to consider briefly the proper operative procedure in cases of vaginal or vulvar anus.

On August 31, 1903, by the courtesy of Dr. R. R. Blair, I was requested to see with him a female child aged nine months. The child was well nourished, of healthy

appearance, and with the exception of constipation during the previous month or six weeks, for which frequent and large doses of a patent medicine had been given with only temporary results, the child had been well from birth. No abnormality had been suspected until two days before, when the mother notices feces coming from the vulva and absence of the normal anus. The previous week Dr. Blair had been consulted because of an indefinite swelling in the left lumbar region and the persistent constipation.

Examination showed an opening five millimeters or about three-eighths of an inch in diameter at the posterior angle of the vulva in the median line just external to the hymen, from which a tape of thick and pasty feces was being extruded with difficulty. The anus was absent, its normal location being covered by the skin very slightly depressed, yielding on pressure, within a rim of firmer tissue which gave the impression of a rudimentary sphincter. A probe passed into the false opening met with a mass of hardened feces, a part of which was removed by forceps. The probe passed backward into a blind pouch which terminated about an inch above the imperforate anus, the end of the probe being felt very indistinctly.

Operation was determined upon and performed the same day, Dr. Blair assisting. Preliminary attempts to clear the rectum failed. After chloroform had been given and the parts cleansed a director was passed through the false opening into the rectal pouch, the point being brought as near the normal site of the anus as possible; and the intervening tissues were incised from before backward to the posterior junction of the rudimentary sphincter, it being desired to preserve this muscle intact as far as possible as assuring better future control of the bowel. The posterior margin of the incised rectal mucous membrane was then seized with a

pair of forceps and drawn down as far as possible while the rectum was emptied and douched. The rectal mucous membrane was then separated by blunt dissection from its attachments on the side and posteriorly to a depth of about an inch and the margin of the false vulvar opening was incised and the anterior rectal wall separated from the vaginal wall along the septum to about an equal distance. The recto-vaginal septum was firm and fibrous similar to scar tissue and sharp dissection was here necessary. The rectal mucous membrane with its large opening was then drawn backward to its normal position without undue tension. It was found, however, that the perineal incision limited by the posterior junction of the sphincter was too small to permit of an anus of sufficient size and the building up of the perinæum and it was carried backward nearly to the coccyx. The posterior portion of the rectal mucous membrane was then attached to the skin at the angle of the incision by two sutures and the lateral portion to the skin margin by two sutures on each side. A suture was then inserted just anterior to this and withdrawn deeply in the wound of one side, then catching the raw surface of the anterior wall of the rectum it was inserted deeply on the other side, emerging on the skin near the wound margin. This suture when drawn together formed the anterior margin of the anus, leaving between it and the posterior vaginal wall a deep pyramidal space which was closed by two deep sutures, closing the wound to the bottom and forming a perinæum of normal appearance.

The space between the posterior commissure and the coccyx in a babe of this age is not large, yet no serious inconvenience was encountered in completing the operation outlined, leaving an anus which would admit an index finger readily and a perinæum of about normal length.

The subsequent surgical history has

been uneventful. There was no local reaction, no rise in temperature and the wound healed by the first intention—the sutures, which were all of fine silver wire, being removed, part on the ninth and the balance on the eleventh day. The bowels moved daily without discomfort. It is yet too soon to declare the final result. Some contraction has already taken place in the size of the anus and more may occur, but it would appear that this can either be controlled or met by some simple procedure. The child promptly gained materially in weight and the result at present is all that could be desired. Not only have the parts been restored to their normal appearance but the mother asserts that the child has control of the bowel.

A review of the literature available on the subject of vaginal and vulvar anus shows that this malformation is well recognized though rare. In only a few of the text-books is the condition mentioned, and then very briefly. Buckmaster, in a paper presented to the American Gynecological Society in 1894, and published in its Transactions of that year, reported a case and collated 51 others occurring from the early part of the sixteenth century to that date. Twenty-two cases have been found reported since 1894, or apparently not included in this report. One of these cases occurred in the practice of Dr. Leonard Freeman of this city. The condition found and the operation performed with excellent results was nearly identical with the case here reported.

No record has been found of a case of vaginal anus which, by the courtesy of the late Dr. Parkhill, I saw in his service at the Arapahoe County Hospital in the fall of 1894. In this case, a child of two and one-half years, there was a fistulous opening, midway in the posterior vaginal wall with imperforate anus. An incision was made in the perinæum to the left of the median line opening the rectal pouch and

the mucous membrane was sutured to the skin. The incision was made laterally in order to utilize the fibers of the levator ani in the hope of gaining control of the bowel. The fistulous opening was not treated, it being the intention to close this at a subsequent sitting, but the patient, so far as known, was lost sight of.

Many of the cases of vaginal and vulvar anus reported were not operated. Some were observed in adults, some of whom were married and had borne children.

The measures adopted for the cure of this malformation have been various. Diffenbach in 1826 incised the perinæum backward from the fistula on a director and dissecting up the rectum attached it to its normal position. The fistula was treated with nitrate of silver, which finally closed, giving an excellent result. Barton, in 1824, and Vicq d'Azyr, in 1832, operated by a simple incision backward and opening the rectal pouch left the wound to granulate while the passage was kept open. In 1856 Rizzoli suggested and performed with success an ideal operation practically as it was done in the case reported in this paper.

This operation, which contemplates an incision backward from the fistulous opening, the detachment of the lower end of the bowel that it may be moved backward and attached to the skin, forming an anus in the normal location and the building up of the perinæum answers every indication for those cases in which the false anus is situated at the vulva or in the lower third of the vagina. The results following this operation so far as reported are excellent and control of the bowel has been obtained.

In the cases in which the fistulous opening is at the middle or upper third of the vagina the difficulties in accomplishing such a complete and satisfactory operation as suggested by Rizzoli are greatly increased. An attempt to detach the rectal

from the vaginal mucous membrane at this point and from its other attachments that it may be drawn down and attached to the skin, forming an anus and a recto-vaginal septum, would involve a very extensive and deep dissection, a risk of opening the peritoneum and the greatly increased risk of suppuration and failure of primary union, if not of serious sepsis. In a small child, if not in an adult, such an operation would be inadvisable if not impracticable at one sitting. In such a case it would be preferable to incise the perinæum and opening the rectal pouch, attach the mucous membrane to the skin if possible, forming a new and ample anus, after which there would be a strong probability of the closure of the fistula. Should the fistula not close, as the histories of several cases indicate that it is likely to do, an operation for its cure could be done at a subsequent sitting. Should the rectal pouch not be sufficiently near the perinæum to permit the Rizzoli operation, an incision should be carried back from the fistula in the median line to a point near the coccyx and the rectal mucous membrane drawn down and attached at the posterior angle and sides, as may be possible without too great tension. This will leave a large cloaca which can be treated subsequently as the condition demands.

The age at which such operations should be performed is not authoritatively determined. It would appear to be desirable to postpone such operation if possible until the child is several months old at least. From the age of six to nine months would appear to be a favorable time for the simpler cases, though some authorities advise that it should be postponed to the sixth or twelfth year, and even to the fourteenth year.

Discussion.

Dr. Perkins: I wish to compliment Dr. Jayne upon his operation and the results ob-

tained; his case is certainly a very interesting one.

In July a year ago I had a case of imperforate anus in a male child twenty hours old. The child was born in the afternoon, and the attending physician was notified of the condition and brought the patient to me about 11 o'clock the following day. I operated, dissecting in about an inch, and was unable to find any opening in the rectum. The parents refused to allow a colotomy to be performed, even for temporary purposes. Consequently I worked for a considerable time dissecting very carefully up as much as an inch before finally insisting upon being allowed to open the colon as a guide to the opening below. They consented, and I opened the colon, put in a large male sound, and found that I lacked yet about half an inch of being high enough to get into the bowel. I continued my dissecting into the bowel, using the sound as a guide and put in a large drainage tube below and another in the artificial anus made in the descending colon, expecting to do a future operation, should the child recover. The patient died that night.

RADIUM.

G. H. STOVER, M. D., DENVER.

We spend our lives surrounded by and immersed in a vast ocean of rays, emanations of various kinds, and innumerable species of vibration. Some produce the sensation of sound, some that of taste, some that of smell and some that of sight, some that of heat. But by far the greater number are unrecognized by our poor and limited organs of special sense. Perhaps some of these vibrations are movements of the ether, perhaps others are waves of moving ions. You will remember that the ion is now believed to be the ultimate division of matter, as much smaller than the atom as the atom is smaller than a sky-scraper building. The discovery of these ions bids fair to revolutionize all our ideas of chemistry and physics, particularly as to the nature and constitution of matter. To make the size of the ion clearer you may represent an atom of hydrogen as being of the size of

Trinity church, the ions composing this atom would be represented comparatively by 700 grains of sand moving to and fro and about each other in that space with inconceivable velocity.

Sir William Crooke's theory of radiant matter, which was received with doubt by scientists when first propounded, may perhaps be accepted after all. The ion is the ultimate of matter, the electron is an ion which is either positively or negatively charged with electricity; the relationship between inertia and the ion or electron must next be studied by our scientists. Does it finally all come down to a vortex of energy, or as I have sometimes defined it, "*nothing* whirling around"? It is too deep for me. When I reach this realm of thought, I am ready to become a materialistic nihilist, denying the existence of anything.

A vast deal of experiment is now going on in laboratories all over the world, but the facts that have been found are still in a nebulous condition, so it is at present useless to speculate upon the nature of these influences by which we are enveloped.

Perhaps some of these vibrations are recognized by the lower animals; it may be that certain of them are sensible to the retina of the cat, mouse, bat and owl, enabling them to move about swiftly in what is to us total darkness; the deep sea fishes living far below a point where sunlight can ever penetrate have specially developed organs which furnish them with light, probably appropriated from some of the waves of energy which are beyond our knowledge.

But so far as our special senses are directly concerned, we are absolutely ignorant of most of these emanations or rays. By intermediate devices, however, some of them are brought indirectly within our ken.

A number of these waves or rays or emanations which have hitherto not been

recognized, have been brought out of the realms of the mysterious unknown, and placed in our hands, with all their wonderful possibilities for harm or benefit to humanity, ready to our use.

The Cathode ray and the Roentgen ray are now more or less familiar to you. For seven years I have been using them for you, and each year have been giving you the results of my experience with them. This year I shall tell you something of what I and others have learned of another variety of rays.

These are given off by several substances, some of them familiar to us, others rather new. Among the substances which possess most prominently the quality of radio-activity are uranium, polonium, thorium, actinium and radium. These seem to have the property inherent in themselves. They can communicate it to some other substances, notably bismuth and platinum. I shall confine myself to the discussion of the most powerful of these, namely, radium.

Radium was discovered a short time ago by two French chemists, Mons. and Mme. Curie, during a long course of researches in radio-activity. Radium is one of the alkaline earths. It is a bi-valent substance. Its atomic weight is 225; That of gold, you will remember, is but 196.7. There is almost no pure radium in existence. A pound of it is almost inconceivable; the production of such a quantity would cost many millions of dollars. It is extracted from pitchblende and uranium ores by a long process of chemical separation and a number of steps of crystallization and re-crystallization. Ore is now, I believe, being shipped from Colorado to Germany, where the radium is to be extracted from it. Most of the radium in existence is in the form of chloride or bromide. The specimen which I show you is the chloride of radium, rated at 17,000 times activity; that is to say, its radio-activity is 17,000

times that of uranium, which is taken as the unit. I have one gramme of this salt which cost \$200, so a pound of it would be worth about \$100,000.

The energy of radium is most wonderful. It is able to melt its weight of ice every hour. Placed in water at the atmospheric temperature, the temperature of the water is soon raised five degrees. It is estimated that the energy of one gramme of radium is equivalent to the force required to raise a weight of 100 pounds to a height of three feet in an hour. Another scientist has estimated that a gramme of radium, spread over a space of one square centimeter, would require a billion years to exhaust itself. If these estimates, based partly on theory of course, are true, a pound of radium would furnish energy enough, if it could be directed and controlled, to perform all the mechanical labor of the whole world for thousands of years,—rather an absurd sounding proposition, is it not, at this time? (The dream of the socialist come true.)

As to the source of the energy of radium there are many conjectures. It is hard to believe that so great a supply can come without replenishment. To me a plausible explanation is, that radium is able to appropriate energy from the ether, and to transform it into radio-activity.

There are three varieties of ray derived from radium. One of them answers to all the tests for the Roentgen ray; it passes through many bodies; it is not refrangible; it is not deflected by a magnet. The other two resemble the Cathode ray in most particulars; one of them, however, is deflected by a magnet in a direction opposite to the direction of deflection of the other, and its ions are said to be positively charged, so I presume that the beta ray, consisting of negatively charged ions, is repelled by the negative pole of a magnet, while the gamma ray is attracted by it. The beta ray is supposed to be

exactly identical with the Cathode ray, and the alpha ray is supposed to be a Roentgen ray.

Radium emanations are not decreased by the immersion of the radium in a cold medium such as liquid air. In liquid hydrogen the radiation is said to be somewhat increased.

The radium ray causes a disassociation of the molecules of gases, the result being that they become electrical conductors. For instance, if an electroscope is given a static charge and then brought under the influence of radium, its charge passes off into the air without being touched. One of the experiments I have performed shows this result beautifully.

These rays cause platino-cyanide of barium to fluoresce, and the same is true of zinc sulphide. Soda glass becomes of a violet color when acted upon by radium.

These rays are not thrown off in definite lines as are the Roentgen rays. They seem to be more of a mist and can be blown out of their course by disturbing influences. For this reason the photographs made by radium do not have the distinct outline of Roentgen ray pictures, but are misty and not sharply defined.

The velocity of these rays is believed to be about one-tenth that of light, or 18,600 miles per second. They affect a photographic plate much more slowly than X-rays, and for this reason and on account of their lack of definite direction will never, I think, supersede the X-ray in skiagraphy.

If one holds a tube containing radium between the fingers for a few minutes, a distinct sensation of sharp heat and formication is felt. The larvæ of frogs have been exposed to the action of radium with the result that many of them were quickly killed, and the survivors who developed were deformed in various ways.

One observer carried a tube containing a small amount of radium in his vest pocket for a number of hours. The result

was a necrosis of the nearby skin which took several months for healing.

My radium tube is carried in a heavy brass case. On one occasion I had this in my coat pocket all one afternoon, and found that in the course of a couple of hours I was conscious of a distinct burning sensation in the skin covering the hip, and some days later the hip was quite lame. This lameness, however, was probably not due to the action of the radium, yet the sensation was not of a rheumatic or gouty nature and I am still at times conscious of a peculiar sensation almost of a burning feeling in that place.

In mice that have been exposed for some time to the radium, there has been paralysis from its destructive action on the spinal cord. Several cases of epithelioma, and one of melano-sarcoma, have been reported by competent observers as having been cured by the exposure to radium.

My own experiments with this substance are as follows:

The chloride of radium is enclosed in a sealed glass tube. On taking this tube between the fingers for from three to five minutes, I felt a distinct heat and tingling.

Applying it to the skin of the forearm: After five to fifteen minutes the heat and tingling are felt. After half an hour this is noticed no longer, and the skin which has been directly under the tube is distinctly less sensitive to touch, pain and temperature, than the surrounding skin. After one hour to two hours there is left a slight erythema, which persists for some hours.

On taking the tube into my main X-ray examining room, which can be made absolutely dark, in a short time the radium tube is distinctly visible by its own light; this is a very soft, white glow.

On applying the radium tube to the distal face of the platino-cyanide of barium fluoroscope, the screen at once glows in an area many times larger than

the area of the side of the tube, and on removing the radium the glow immediately ceases.

Putting one of my X-ray coils in operation, and setting the parallel spark cap a little too far open for the sparks to pass, then bringing the tube of radium near this gap, the sparks began to pass; removing the radium, the sparks ceased. This may be repeated time after time with the same result, proving that the action of the radium has made the air an electrical conductor.

Sitting in a perfectly dark room and closing the eyes, if the tube of radium is brought close to the eyelids a sensation of light is distinctly perceived, which disappears on removal of the tube. The same is true if the tube is applied to the forehead, or to the temple. Contrary to the statement of some observers, I have not been able to perceive the sensation of light when the tube is brought in contact with the rear of the head near the brain center of vision.

With the tube enclosed in its case, consisting of, first, a rubber tube $1/16$ inch in thickness, and this surrounded by a brass tube $1/10$ inch in thickness, and examining this with the fluoroscope, the screen glows distinctly. Placing lead of a thickness of $1/10$ inch between the radium case and the screen, I am still able to perceive a light on the screen.

The first photograph which I made with radium was done by placing the sensitive plate in an ordinary plate-holder, laying upon the slide of the plate-holder a number of metallic objects, and suspending the radium tube about eight inches above these, I allowed it to act for a period of one hour, with the result that I obtained an excellent photograph, or shadowgraph, of the objects.

Another experiment consisted in laying a door key on the slide of the plate-holder and placing the tube of radium directly upon the key and allowing it to act for

ten minutes. Here I also got an excellent likeness of the key. A pocket volt-meter was laid on the slide of the plate-holder, and the radium tube placed directly upon it and left there one hour. This gave one of the best pictures I have obtained, and even shows some of the interior of the volt-meter. Placing a pair of surgical scissors on the slide of the plate-holder with the radium tube suspended eight inches above for a period of one hour, I got a reasonably good picture.

I have been attempting to produce a burn upon my own person with the radium in order that I might exhibit it to you, making exposures with the tube fastened directly to the forearm for periods of from ten minutes to one hour, but did not succeed in producing a burn. A few evenings ago I made a similar exposure lasting three hours, but have not yet anything to show for it.

The first patient whom I treated by radium was Col. W. He has a cancer of the nose, involving the floor of the right nostril, part of the cheek, with a perforation opening underneath the upper lip, and some ulceration of the gum on the right side. I have treated him some with the X-ray, with apparently a hopeful result, but a slight relapse occurring, I decided to use the radium, and have been making exposures, at first of ten minutes, but lately of an hour's duration. There has unquestionably been some favorable action in this case from the radium.

The second patient was Mrs. C., a sarcoma involving the right nostril. I had treated her awhile with the X-ray, with the apparent result of arresting the growth. The radium tube was placed in the nostril, the portion not in contact with the growth being wrapped in sheet lead. Exposures of from five minutes at first, to an hour of late, have been made, but the growth is increasing, and I have returned to the use of the X-ray.

The third patient was Mrs. G., who has a recurrence of inoperable carcinoma of the uterus and surrounding tissues. A number of exposures have been made, many of them of an hour's duration, but I cannot say that any result so far has been attained.

It is in my mind to attempt the treatment of some inoperable cases by placing the radium tube in the center of the growth through an incision, and leaving it there for some hours. I think one reason why I have not had more result from the radium in the cases treated, has been that the exposures were not long enough. I was perhaps misled as to the time of exposure necessary by an experiment I made in that line. Placing a piece of beef three-quarters of an inch thick on the slide of a plate-holder containing a plate, I laid the radium tube directly on this and allowed it to act for thirty minutes, with the result that the action of the ray was very plainly visible on the plate. In my future experiments with radium on malignant growth I shall make very much longer exposures.

I have not attempted to treat epithelioma of the skin as ordinarily seen, with radium, because I know so absolutely what the X-ray will do for these cases, and am so satisfied with the certainty of the result that I feel there is no need to experiment with other things.

My object in presenting this matter to you has been simply to give you in a collected form what information is available on the subject of a new and wonderful substance, which may perhaps be of some use to us as physicians, but at the present time I feel that it is not entitled to a very high place in our regard, that it will never equal the X-ray for skiagraphic work, and that it will probably never equal the X-ray as a therapeutic agent. The only use I can see for radium is in a few cases which do not react to the X-ray, or some in which the lesion is so seated that the

X-ray cannot be made to reach it effectively.

TESTING OF VISION IN THE PUBLIC SCHOOLS.

EDWARD JACKSON, M. D., DENVER.

All work laid down in the school curriculum is carried on by use of the power of vision. Therefore, apart from other benefits, it is reasonable to know that the scholar has good vision before setting him to tasks that require good vision for their performance. Great care is taken, before admitting a scholar to a certain grade, to ascertain that he is prepared to do the work of that grade by a proper acquaintance with preliminary branches. But no provision whatever has been made to ascertain if he had the vision necessary to prosecute with advantage his studies in that grade, or in any other.

Very few persons have any conception of the injustice and injury that have been done to children by ignoring their visual disabilities. "As a boy," said a former president of this society, "I knew for years that I was near-sighted. But I was not permitted to wear glasses. One day the teacher called on me to read something from the blackboard across the room. I told him I could not do it. He said, 'Yes you can,' then told another boy to do it. The other boy read it, then I was told again to read it. I said I could not see it. The teacher boxed my ear and gave me five demerits."

This case seems very striking, viewed from the standpoint of the boy, who at that time probably had 4 or 5 dipters of myopia. But if less brutally manifested, exactly this disregard of visual inability for school work, has marked the attitude of parents and school authorities in general, and in many places still characterizes their attitude toward this subject.

In connection with the foregoing incident, it ought to be emphasized that, as a

rule, the teacher has been more alive to the existence and serious consequences of such disabilities than have either the authorities, who sit in judgment of the teacher's qualifications, or the parents of the children. But without standards of visual acuteness or knowledge of how to apply them the teacher has been able to do but little.

The existence and importance of visual disability in the scholar must be recognized throughout the whole educational scheme. Teachers must know what children have defective sight, and arrange the school requirements accordingly. School authorities must provide the means for discovering and estimating such defects. And when a defect is found, the parents must be awakened to their responsibility in the matter of having it corrected, in so far as correction is possible.

In this, as in other matters, custom, tradition, and popular impression cannot be changed at once; but some very simple practical measures, immediately at hand, will accomplish a great deal, and will open the way for more efficient measures in future. It is essential that those in immediate charge of school work should know of the existence and extent of the visual disability of the scholar. Moreover, if the teacher knows just how the presence and extent of this disability is ascertained, he or she will more fully appreciate its significance and importance. Therefore, let the teacher or principal of each school conduct the necessary tests. This method was suggested sixteen years ago; and it is the only method that has yet been successfully applied to any large number of scholars in our public schools.

It is necessarily limited to such an investigation as teachers can make, without any great expenditure of time, and without much special preparation. It is not the best that we can imagine possible. Indeed, in private schools, where money

is available to pay for examinations by experts, better plans are already in operation, and have been for several years. But it is so much better than nothing, and its influence in drawing attention to the subject and preparing the way for better things in future is so important, that until parents and school authorities are ready to have something better, it ought to be in operation in every public school.

WHAT SHOULD THE TEST INCLUDE?

They must be restricted to those which the teachers can apply with reasonable certainty of reaching correct results. In the card first suggested I provided for three tests: Letters to test the acuteness of distant vision; fine print to determine the near point of accommodation; and line tests for astigmatism. Others have proposed and used different forms of these

to be answered regarding the effects of school work upon the scholar:

1. Does the pupil habitually suffer from inflamed lids and eyes?

2. Do the eyes and head habitually grow weary and painful after study? Attention to these two points, with the knowledge of the child's acuteness of vision, will reveal practically all cases in which ocular defects constitute a serious hindrance in school work, or in which school work is likely to prove disastrous to the scholar's eyes.

THE TEST OF VISUAL ACUTENESS.

This can be made very simple; and the more simple it is the less liability will there be to error through unskillful application. All that is necessary is to have letters of known size just recognized at a known distance.

V L O F H E B

same tests. But Dr. Frank Allport, who first succeeded in getting such tests adopted and generally used throughout a large city (Minneapolis in 1894), discarded all but the letters for testing the acuteness of vision. No doubt it was wise to fix the attention on this single test. Even in expert hands the tests for the near point of accommodation and the line tests for astigmatism, if entirely relied upon, will very frequently prove misleading. The results to be obtained by them are not sufficiently important and reliable to justify the time and effort required for their application to large numbers of children.

The simple test of visual acuteness will reveal any defect that would be likely to interfere with the use of the eyes in school work, except hyperopia and quite low degrees of astigmatism. That these might not escape attention, Dr. Allport supplemented his test by these questions,

The large test card with a full series of letters of different sizes is quite unnecessary. It is waste of time to have the child read line after line of letters to get at the smallest letters that can be seen at 20 feet,—the line which really constitutes the test. Such a card requires considerable explanation to make the child understand just what is expected of him. Then some children, after reading a few lines will not make the same effort; but cease it before reaching the real limit of their visual acuteness. The large card is very much more expensive. On this account it is difficult to provide different cards to guard against familiarity with one set of letters. On all of these accounts the test now to be described is preferable.

It consists of a single row of test letters, all of which can be just recognized by an eye with full visual acuteness at a distance of 20 feet. This card is placed

in a good light and the distance of 20 feet laid off in front of it, each 2 feet being marked on the floor or wall. If the letters cannot be read at 20 feet, the child is brought nearer until he can recognize them. The distance in feet at which they are read gives the number of 20ths of full vision. Thus, if they are all read only at 12 feet, vision will be recorded as 12/20. Each eye is to be tested separately, the other being excluded by covering in such a way as to make no pressure upon it. The child may be allowed to read a part of the line with the right eye, and the cover then shifted to it, and the remaining letters read with the left eye; or, a separate card can be used for each eye. Two such cards have commonly been furnished, but four or six could be supplied at much less cost than the single large test card. This form of test was introduced three years ago in the public schools of the three principal districts of Denver. It can readily be applied to all who have fairly learned the alphabet; all above the first grade; all who will be taxed by school work.

OTHER TESTS.

Of course other methods might be applied with advantage if it were possible to secure the services of specially trained examiners. Thus, skiascopy would reveal low degrees of astigmatism, and the refraction ophthalmoscope would bring to light cases of hyperopia; which, under the above plan, could only be suspected from the headache or symptoms of inflammation arising from them. The ophthalmoscope would also show when eyes, even those free from any error of refraction, were being damaged by excessive close work, poor light, or work during periods of impaired general health.

Tests for color blindness among boys would prevent some mistakes in the choice of a trade or profession. Then the results of a more thorough examination

would be slightly more certain and exact in every way. But it would be the height of folly to decline the benefits of the simple plan here outlined, because greater benefits are conceivable under conditions that do not yet exist. Especially when such conditions might be brought about by putting in operation the plan which is already perfectly practicable.

WHAT CAN BE DONE ABOUT IT?

At the recent meeting of the American Medical Association the following resolutions were adopted, both by the sections especially concerned with these branches, and the House of Delegates of the whole Association.

"Whereas, the value of perfect sight and hearing is not fully appreciated by educators, and neglect of the delicate organs of vision and hearing often leads to disease of these structures; therefore be it

"Resolved, That it is the sense of the American Medical Association that measures be taken by boards of health, boards of education and school authorities; and, where possible, legislation be secured, looking to the examination of the eyes and ears of all school children, that disease in its incipency may be discovered and corrected."

In this line it is suggested: 1st. That the individual members of the society take up the matter, each in connection with the school authorities of his or her own locality. 2nd. That this society, through its House of Delegates, adopt something like the following:

Resolved, That in the judgment of the Colorado State Medical Society, simple tests of sight and hearing should be applied to every scholar in the public schools.

Resolved, That the State Board of Health, and the school authorities throughout the state, are requested to give early attention to the matter, and secure the systematic use of such tests, to be applied annually to all pupils.

TESTING OF HEARING OF PUPILS IN THE PUBLIC SCHOOLS.

By WM. C. BANE, M. D., DENVER.

The importance of having good hearing at all times is manifest to every one. This is especially true for the period of school life. The child that is dull of hearing is handicapped in its efforts to acquire an education. Some children have defective hearing as a result of inflammation or disease of the ears, the sequelæ of scarlet fever, measles or influenza, others from abnormal growths in the nose and vault of the pharynx that interfere with the normal entrance of air through the eustachian tubes to the middle ears.

Adenoid growths do more than impair the hearing, they greatly interfere with the normal function of nasal breathing and thus injure the general health by causing mouth breathing. Children with abnormal growths in the naso-pharyngeal space are frequently dull and stupid and wear a listless expression on their faces. It is remarkable how rapidly these little sufferers brighten up after the growths have been removed.

Scarlet fever, in a large percentage of cases, plays havoc with the organs of hearing, causing rapid destruction of the drum membrane and very often total loss of the incus and a part of the malleus, leaving in its wake a discharging ear with an offensive odor that the child does not "grow out of." Many such patients can be permanently benefited by removal of the diseased tissue and necrosed bone.

When we consider the importance of the children and youth of our state having, so far as possible, the full sense of hearing, it is our duty, as humanitarians, to urge upon the State Board of Health and Board of Education, the great need of systematic, yearly examinations of the pupils of our schools, that those who are defective in hearing may have the benefit

of whatever assistance is obtainable for their relief.

For some years the testing of the hearing of school children, in connection with that of vision, has been advocated by Dr. Frank Allport of Chicago. Through his noble efforts, with the assistance of others, much has already been accomplished in the way of testing the hearing of school children in several of the states. About three years ago, the Denver and Arapahoe County Medical Society took favorable action and appointed a committee of oculists and aurists of the city to present the subject of testing the vision and hearing of the pupils to the School Board. The result was that the principals and teachers of the city schools received instructions in the tests for vision and hearing and the pupils were examined, but the examinations have not been made each successive year.

TESTS OF HEARING.

Two simple tests of the hearing can be made use of, viz., the tick of a watch and the whispered voice. Before using a watch it should be tried on several persons with presumably normal hearing, and the distance at which it is heard noted as the denominator. This may be any number of feet, according to the loudness of the tick. Supposing it to be five feet or sixty inches, we proceed to use it as a basis for testing. Both eyes had better be closed. One ear is plugged with cotton and the other approached with the watch from a greater distance than at which it was heard by a normal ear. The distance at which the watch is heard by the pupil is the numerator to be placed over the denominator, or the distance at which the watch was heard by the normal ear. If the pupil hears the watch at 36 inches when the normal distance is 60 inches, the record would be 36/60. The fellow ear is then tested, the cotton having been transferred to the first ear tested.

The whisper test is the most satisfactory. The pupil is placed 20 feet away, the eyes closed, and one ear plugged and turned away from the examiner. The examiner then speaks double numbers—as 16 and 21 and 34—in a whisper and the pupil repeats aloud what he hears. If the pupil is unable to catch what is said at 20 feet, the examiner approaches the pupil whispering numbers, and when near enough to be understood, the pupil will repeat the numbers. The distance in feet at which the numbers are heard give the numerator, the 20 feet being the denominator. The following pertinent questions, much the same as proposed by Dr. Allport, may be asked and the answers recorded, as they bear upon the points referred to above.

1. Does the pupil fail to hear the watch at the normal distance with each ear?
2. Does the pupil fail to hear the whispered double numbers at 20 feet with each ear?
3. Does pus or foul odor proceed from either ear?
4. Is the pupil unable to breathe freely through either nostril?
5. Does he breathe with his mouth open, especially at night?

If an affirmative answer is given to any of these questions, there is sufficient reason for the teacher or principal to call the parent's attention to the defect and recommend that treatment be instituted.

Discussion.

Dr. Friedmann: This paper is quite worthy of recommendation to a more extensive audience, as the backing up of such examinations by school authorities will establish in the parents of pupils the firm belief that they have to deal here with a sanitary rule, beneficial to their children. When Dr. Jackson, proposing such examinations by teachers, thinks that something is better than nothing, I can only consent; but I wish that they would give a start to regular examinations by experts, as only those can give us what we need, a generation of citizens

fitted to fill their places in life, as far as eyesight is concerned.

It would take me too long to enumerate the many advantages arising from such measures. Let it be sufficient to say that their utter necessity is fully proved by occurrences like the one reported some time ago from Marburg, Germany, where more than fifty school children were taken ill of a follicular conjunctivitis of an infectious nature, at the same time. If we know of a possible means to prevent such an epidemic, we ought surely to take it, and, as I said before, I feel certain that in time we will.

The single line test types advised by Dr. Jackson are very ingenious, and will do the work better than any other I have ever heard of. Of course we must keep in mind the fact that there is a whole group of disturbances of the eye-sight, especially frequent in children, which the school teacher is not able to discover, and which even the expert cannot trace without the use of mydriatics. I am thinking here mostly of spasm of accommodation and similar affections. A little trick which might help the teacher in examining a pupil's eyes, without the other children learning the letters by heart at the same time, is to have the test card attached to the wall at their back, so that they will not be able to see the letters before they are asked to turn and read them.

When I proposed the employment of an oculist for the public schools of our city, I gave at the end of my letter the following reasons:

First. In order to prevent epidemics of eye diseases by timely discovery of infected boys and girls.

Second. In order to prevent eyes with a tendency to weakness or disease from impairment, by prescribing correcting glasses or giving other treatment.

Third. To give to people without means a chance of having proper care taken of the eyes of their children, which would not be possible, if, for them an expense, be it large or small, were connected with it.

Fourth. For the reason that many constitutional and other diseases amenable to treatment have been found to be existing in the organism of a child, when accidentally the eyes were examined.

Fifth. For the scientific output both in practice and theory.

Dr. Melvin: To show that the suggestion of Dr. Jackson is thoroughly practicable, I will

mention the fact that for the past eight years in our schools in the country, where I have been president of the school board, I have put into effect, through one of the teachers, exactly one of the examinations which he describes. Every year two hundred of the pupils have been examined and a record for the past eight years has been kept of those examinations. It has resulted in the discovery in every year of from three to eight pupils who were unable to do their school work because of their vision. In those cases usually one or two each year were absolutely excluded from school on account of the astigmatism. The work in those schools has been very satisfactory to me, although in the hands of an unskilled teacher. I believe in all the schools, city as well as country, that these examinations are thoroughly practical and advantageous.

Dr. Black. If we had a few more Dr. Melvins throughout the state, Mr. President, I feel sure that our arrangement would be entirely satisfactory everywhere and that Dr. Jackson's paper would not be necessary. He has already stated that this has been in operation in Denver for about three or four years, and found to be very satisfactory. We took the matter up at that time and had no particular trouble in bringing about this examination; and examination by the teachers certainly is about the only sort of examination that can be brought about at the present time. This should be a very easy matter in every school district in this state and it would be invaluable. It is as important, if not more important, than any preliminary examination that can be held prior to the introduction of the pupil into the schools; and the teacher is thoroughly qualified for making them.

Dr. Spivak. The question put to the child as to whether or not he breathes through the mouth is of course a pretty good one, but as to whether the answer forthcoming will be the right one I have much doubt. I have had a good many patients of 30, 40 or 50 years of age who did not know that they breathed through their mouths. It is a question that should be put at the first examination, and if the answer is a negative one, it is not to be accepted until the patient is watched and the exact truth ascertained. The patients themselves don't know whether they breathe through their mouths or not. They must be watched by somebody else. It is very exceptional that one could go and tell his physician that he breathes through the

mouth or otherwise. They don't know, and therefore an answer in the negative does not mean anything at all. I think it would be a good idea to ask the mother or the father, or some one in the family to watch them in the night to see whether they breathe through the mouth or not; or at least put the question to the mother whether the child breathes through the mouth or not.

Dr. Jackson: The experience of Dr. Melvin is extremely interesting; and it gives point to the first suggestion we have made in this matter.

Dr. Bane: Just a word in answer to Dr. Spivak. The questions proposed are to be answered by the teachers, and it is for them to find out whether the child breathes through its mouth either during the day time or the night time. It will be noticed I add "especially at night," which necessitates inquiry to find out whether the child does breathe through the mouth day and night.

TENDON LOSSES.

GEORGE W. MIEL, M. D., OF DENVER.

When the tendons of the forearm or hand, leg or foot, are involved by injury, their preservation or restoration carries special surgical considerations. Too often it happens that wounds (usually incised) are closed without ascertaining whether or not injury is done them, or without investigating the extent of their injury.

Deep and considerably incised or lacerated wounds of the arm or wrist, lower leg or ankle, are apt to completely divide the entire extensor or flexor group in relation, and their proper end to end union by suture is apt to tax our best efforts. First, the proximal end, owing to muscular contraction, may be hard to find, and when found it is not always easy to ascertain the proper lower connection. If the ends of a divided tendon are not connected we have tendon loss; partial, or perhaps complete. If the ends are misconnected we have at least partial loss of function.

In drawing tendon ends together for suture, it is often necessary by reason of muscular contraction to grasp them tightly with forceps; if so, the part grasped (the

very end) is better excised to obviate slough. Simple end to end suture with chromicised catgut seems to me the preferable procedure. To connect the ends two sutures are introduced; one of medium size penetrating the tendon from one-third to one-half an inch away from each end to take tension, the other fine, and passed close to the ends for coaptation. If more than lax tension exists, or if muscular spasm may arise, I count it safer to stitch the tendon in one or two places to the neighboring tissue, tying with very moderate tension, which would in no wise imperil the circulation of the tendon. It is next important to maintain the flexors or extensors involved lax; by permanently placing, during treatment, the hand or foot in a sufficiently flexed or over-extended relation.

If injury to the tendon or tendons is connected with contusing or mangling damage to the integumentary or other covering, it is essential that any suture holding or grouping this covering shall be absolutely lax and not allowed to become tense; otherwise the condition is apt to be complicated by slough.

Should part of the tendon be torn away, and end to end suture be impracticable, I would endeavor to remedy the loss by employing a heavy communicating suture of chromicised catgut, and stitch the tendon ends to contiguous tissue at easy tension. It is then, and afterward during treatment, necessary to place and maintain the hand or foot (as the case may be) in a sufficiently flexed or over-extended relation. Where tendons are uncovered by injury, and not divided, if possible, they should be sunk between muscles or given any other adjacent tissue covering by grouping suture. If this is not attainable, it may be possible to incise contiguous tissue without imperiling its vitality and slide it over otherwise exposed tendons. In other instances, if there be reasonable expectation of asepsis, an in-

duced blood clot may cover acceptably until granulations supplant it.

Occasionally the entire integument is torn from the dorsum of the foot, exposing the superficial extensors. Even though they themselves have sustained slight injury, these lowly vitalized structures will likely succumb unless a covering of granulations is quickly forced. I know of no means from which we could expect better result than from the application of the unscientific, and commonly considered unsurgical flax-seed poultice.

Where there is tendon loss by slough the tendon ends should be kept close to the wound, and at the later stage of repair it may be possible to bring them into closer relation, by grouping approximation of the wound walls. Meanwhile, from the beginning the hand or foot in relation should be kept during treatment sufficiently and continuously flexed or over-extended, according to requirement, in a plaster of Paris immobilizing splint extending to the tips of the fingers or toes; trapped at the wound for purposes of dressing. This splint is also applicable when muscle loss leaves tendons lax.

Too often, in connection with extensor losses, the plaster immobilizing dressing employed is not continued to, or over the toes, and in consequence they hang over, leaving the ligaments lax, later dragging when walking without shoes or slippers. This is more emphasized when the extension employed has not been sufficiently extreme, the foot then drooping. As the sequence of this provision of treatment in cases of tendon loss, the resulting deep and tough cicatrix becomes the pulley of the tendons; losing some of their former function and play, they nevertheless retain great usefulness.

I have seen all the extensors of the right forearm lost, in the instance of a laundry girl feeding her arm to a mangle, the dorsal integument succumbing to slough, and about two inches of each ex-

tensor tendon with it, and yet treated in this way, to my surprise really good function was re-established and the hand recovered its natural support. I have also seen in another case all the extensor tendons of the foot severed just above the ankle, and an inch of each lost by slough. Yet under this procedure, the natural relation of the foot at a right angle was retained, and good function and gait were only slightly impeded.

In concluding I need hardly say that multiple tendon loss involving the flexors is not apt to be attended with deformity, but connects more particularly with loss of function. While multiple tendon loss involving the extensors, unless remedied, allows a crippling droop of the hand or foot in addition to loss of function.

Discussion.

Dr. Freeman: I think there is no more important subject in emergency surgery than Dr. Miel has taken up in his paper. His method of uniting the ends of divided tendons is certainly sufficient in most cases; and yet where the tension is great, instead of taking a suture between the tendon and the adjacent tissues, it is sometimes better, I think, to tie a small bundle of the tendon upon each side, not enough to impair the nutrition of the entire tendon, but enough to give firm hold to the sutures. Do this with both distal and proximal ends, and then tie the two sets of sutures together. This sacrifices a bit of tendon upon each side, but it makes a more firm anchorage than by suturing the tendon to the adjacent sheath.

If I heard correctly, Dr. Miel has not mentioned another expedient which can be resorted to. For instance, a man has had a crushing of the tendons of the back of the hand, a portion of a tendon is lost. We can find the distal end but the proximal end is gone. It is perfectly feasible, and answers the purpose in many instances, to attach the distal end to some other adjacent tendon. This I have done in a number of instances and got very fair results. For instance, in one case the extensor tendons of the thumb were torn. I could find the distal ends going to the thumb, but the proximal ends were largely lost. These thumb tendons were fastened to the

extensor tendons of the fingers and fairly good use of the thumb was afterwards obtained.

Dr. Miel: I am very glad that Dr. Freeman made these supplemental suggestions. I had not expected to cover all the work of tendon surgery. My object in presenting the paper was more to cover those cases in which there was considerable loss of extensor tendons by slough. I have noted instances where individuals have lost a large part of the function of the foot or hand simply by forgetting or failing to appreciate the benefit that might come to those people by placing either the hand or the foot in a very extended relation. I have never seen plaster dressings efficiently applied to such cases, and I make an effort always myself to go to the very tips of either the fingers or the toes and try to secure this considerable over-extension when the member is going through repair, so that we may have the support from this which we can reasonably expect, and prevent drooping deformity.

Biographical Sketch of Thomas H. Hawkins, M. D.

Dr. Thomas Hayden Hawkins, President of the Colorado State Medical Society for the year 1903-4 was born in Kentucky. He is of English descent; his father, the Rev. John Hawkins, tracing his ancestry to Sir John Hawkins, the famous British navigator, and his mother, Elizabeth Stodghil, being descended from Lord Shelburn, some of whose family settled in Virginia.

His early life was spent on a farm, attending school three months each winter. At eighteen he went to Zionsville Academy, and a year later to Asbury, now De Pauw University, where he attended for three years. Later he received the degree of A. M. from this institution, and, also, from Baker University, Kansas; and the degree of L. L. D. from the College of the Northwest.

In 1870 he began the study of medicine in the office of Dr. T. H. Lane, of Northfield, Ind. He attended one course of lectures in the University of Louisville, being a special student of Prof. Theophilus Parvin. In 1873 he graduated from Bellevue Hospital Medical College, N. Y. He served a little over a year in the Forty-Second Street Hospital, Dr. V. P. Gibney being a fellow interne in that institution.

He entered upon practice in New York City, and was connected with the out-patient department of Bellevue Hospital and the Eastern Dispensary. From 1876 to 1880 he was pro-

fessor of Physiology in the Columbia College of Comparative Medicine. In the latter year he left New York and located in Denver, engaging in general practice but giving especial attention to surgery.

was formed by the union of the two previously existing schools, Dr. Hawkins accepted a similar chair in the new institution, and became one of its trustees. He was, for several years, Attending Gynecologist and Member of the



DR. THOMAS H. HAWKINS.

In 1881 he founded the Denver Medical Times, which he has edited ever since. In 1888 he was the active leader in the establishment of the Gross Medical College, in which he held the chair of Gynecology and Abdominal Surgery; and was its President. When in 1902 the Denver and Gross College of Medicine

Supervisory Board of the Arapahoe County Hospital. Since 1894 he has been Surgeon to St. Anthony's Hospital, and President of its Medical Staff. He has been President of the Association of Medical Editors, and Vice President and Member of the Judicial Council of the American Medical College Association.

COUNTY MEDICAL SOCIETIES.

..**Boulder County Medical Society** holds its regular monthly meetings in the County Court House on the first Thursday of each month at 8 p. m. Twelve meetings were held during 1903, and ten papers read and discussed. The program each month consists in the presentation of papers by the members and invited guests, and clinical reports of interesting cases. The Society has a membership of thirty-two. Dr. E. B. Queal is President; O. M. Gilbert, Vice President; M. E. Miles, Treasurer, and W. W. Reed, Secretary.

The meeting held December 3 was given up to business, clinical reports and discussions thereon. Dr. Cattermole reported a case of **Abdominal Pregnancy** which had formerly been tubal with a history of rupture pain, shock, hemorrhage, etc., about the third month. The case was developing as an abdominal pregnancy, having reached about the seventh month and promised to be very interesting in its outcome.

Dr. Miles reported a typical case of **Appendicitis** treated by the Ochsner method with a good recovery. Dr. Miles believed that cases treated in this way would very often recover, and operative procedure be avoided. He did not favor the immediate operation.

Dr. Reed reported a case of supposed **Pseudocyesis** in which all the subjective signs of pregnancy were present, but none of the objective. Patient 39 years of age, has four children, the youngest being 19. She is now living with her second husband, and is very anxious for a child by him.

W. W. REED, Sec.

Denver. At the meeting of December 1, R. T. Ramsey reviewed the pamphlet prepared for general distribution by Dr. F. C. Valentine of New York, entitled "**The Boys' Venereal Peril**," and discussed the physician's duty in this connection. He recognized the duties of parents and others, and pointed out that the ideal physician could do much in this direction to prevent disease and suffering; that individual instruction given at the opportune time was the most valuable of all teaching; and that opportunity comes to those who look for it. The paper was discussed by Drs. Van Zant, P. D. Rothwell, Love, Hamilton, Ray, Jackson, Gengenbach, Thorp, Wetherill and Whitney; the discussion being closed by Dr. Ramsey.

Dr. C. D. Spivak read a paper upon **Aerophagia**. He analyzed the literature of the

subject, and reported a case from his own practice in which the habit of air swallowing had caused much emaciation, with annoying symptoms of gastric distension. He pointed out that the digestive tube normally contains air at all times, and that this may be essential to the process of digestion. The habit of air swallowing may be acquired in the effort to secure relief by producing eructations. At first the act was voluntary and conscious, but by habit it might become unconscious and involuntary. In the majority of cases aerophagia is a symptom of some neurosis. If associated with hysteria it might be involuntary; with neurasthenia it was voluntary. Swallowing was attended with the usual movements of the pharynx and larynx and some noise. The sound, however, was less marked and differed from that which attended the less frequent eructations. Treatment consisted in the treatment of the neurosis and in preventing the swallowing of air by voluntary control. Where this was difficult, keeping of the mouth open would sometimes enable the patient to overcome the habit.

Dr. F. W. Stevens read a paper upon the **Treatment of Paralytic Strabismus**. In recent cases the indications were: To prevent diplopia by covering the affected eye, and to treat the lesion causing the paralysis, as with large doses of potassium iodide for cases of syphilitic or unknown origin; salicylates for rheumatism, tonics in diphtheritic cases, etc. But where the medical cure failed and the strabismus persisted for a longer time, surgical treatment was justified. He exhibited a boy who had absolute paralysis of the right external rectus and a convergent squint of 60 degrees. The left eye being amblyopic, was the squinting eye and to see with the right the head was carried in a position simulating trochocollis. Advancement of the right external rectus, with tenotomy of the left internal rectus, had given a perfect cosmetic result. He reported another case of paralysis of the external rectus relieved in the same way, and two cases of paralysis of the superior oblique; one cured by medical treatment; the other relieved by a tenotomy of the superior rectus.

W. C. Bane read a paper on **Therapeutics of Some External Diseases of the Eye**. He referred to the importance of rest, and the early use of cold in certain cases, and of heat at a late stage. To prevent contamination of collyria, he used as a basis the solution of trikresol 1:1000. Trikresolized vaseline was

also recommended. Cocaine and holocaine were both important local anaesthetics serving slightly different purposes. Dionin he had found of doubtful value. An ointment of amoniated mercury he regarded as equal in value to that of the yellow oxid of mercury. Of the newer silver salts, argyrol was entirely non-irritant and has proved of value in ophthalmia neonatorum and dacryocystitis. He was not, however, disposed to dispense entirely with nitrate of silver.

In discussing the above papers, Dr. Black urged the use of an emulsified base, like rose water ointment, for ointment to be used in the eye. Dr. Jackson pointed out the danger of silver staining of the conjunctiva from the use of the new silver salts.

F. W. Kenney reported his observations upon the **Use of Formaldehyde as a Preservative of Urine**. He found that urine free from albumin, to which the watery solution of formaldehyde had been added, gave with Heller's test, a band similar to that given by albuminous urine. The rapidity and distinctness of the reaction increased with the proportion of formalin used. Nonalbuminous urine so treated also gave reactions with heat and nitric acid similar to those of albuminous urine. He also found that formaldehyde prevented or caused rapid clearing of cloudiness due to excessive urates.

R. L. Thorp reported a case of **Rectal Ulcer, Simulating Pulmonary Tuberculosis**. The patient had lost a great deal of weight and suffered from a severe cough, with profuse expectoration. He had been sent to Colorado from Ohio for tuberculosis, and stated that the tubercle bacilli had been found in his sputum. Repeated observations failed to confirm this. Pain in the lower part of the back led to the discovery of the ulcer; and improvement in all other symptoms and complete restoration followed the treatment of the ulcer.

May B. Teele reported a case of very **Severe Recurring Headache**, which had lasted twenty years, cured by tri-weekly applications of galvanic and Faradic electricity.

Las Animas County. The banquet celebrating the Twenty-First Anniversary of the Las Animas County Medical Society was held at the Cardenas Hotel, Trinidad, the evening of December 17. Seventeen physicians, with fifteen of their wives and daughters participated. The President, Dr. T. J. Forhan, introduced Dr. John Grass as toastmaster. The following toasts were responded to: "The His-

tory of the Society," Dr. Perry Jaffa; "The Diagnostican," Dr. Leonard Freeman of Denver; "Why We Are Doctors," Dr. Thompson; "Some Cases of Failure," Dr. J. N. Hall of Denver; "The Boys," Dr. Robinson; "The Banquet," Dr. Carmichael; "The Profession," J. R. Espey; and "The Ladies," Dr. Forham. The music interspersed throughout the program fully sustained the traditions of the Colorado profession regarding such occasions.

PERRY JAFFA, Secretary.

Otero County.—The regular meeting was held December 9, at La Junta. The election of officers resulted as follows: President, J. F. Kearns, La Junta; Vice President, Carl Myer, Rocky Ford; Secretary, E. Gard Edwards, La Junta; Treasurer, A. L. Stubbs, La Junta; Delegate, Frank Finney, La Junta. Drs. Haskins and Timmerman, the retiring President and Secretary, were tendered a vote of thanks for their services in the reorganization of the society. No papers were read, but it was decided to make out a "dead beat list" for presentation at the next meeting, which will be held at La Junta January 12.

E. GARD EDWARDS, Sec.

OTHER SOCIETIES.

Denver Clinical and Pathological Society.—At the Meeting of December 11, there was exhibited by Dr. Van Zant a calcareous mass that had been expectorated; by Dr. Levy, an applicator for use in the post-nasal space; and by Dr. Hickey an instrument for the detection of albumin with Heller's test. Dr. Kenney exhibited a specimen of non-albuminous urine showing the reaction of albumin due to the use of formaldehyde as a preservative.

Dr. Edson reported a case of **Pulmonary Embolism** with severe cardiac disturbance, five weeks after vaginal hysterectomy. In a week the pulmonary signs disappeared, but there was **thrombosis** of the right femoral region. This cleared up and the lower half of the left thigh became affected; next the right subclavian and axillary region were attacked, the external jugular being completely occluded. After this complete obstruction of the circulation and gangrene extending to the middle of the arm occurred on the left side. The patient died on the twenty-second day. There were no heart murmurs and all pulmonary signs disappeared after the first week.

Dr. Levy reported pneumonia in a child following operation for adenoids with nitrous-oxid anaesthesia. Dr. Hickey reported a case

of severe oedema of the naso-pharynx, lips, face and scalp, produced by the injection of 10 c. c. of **anti-streptococcic serum**. Dr. Freeman reported a case of supposed intestinal obstruction which proved fatal in the second attack. Autopsy disclosed a thrombus of the superior mesenteric vein and hob-nailed liver. Dr. Stover reported a case of senile wart, of fifteen years' duration, treated by the X-ray exposures, with no recurrence after eight months. Dr. Bonney related his experience with anti-streptococcic serums in the treatment of tuberculosis. For a time he had ceased their use on account of the unpleasant effects produced; but he believed they were of positive value. He also reported a case of appendicitis, not operated on, followed by pericarditis, consolidation of both lungs, and nephritis.

F. W. KENNEY, Sec.

Colorado Ophthalmological Society.—The meeting of December 19 was held at Colorado Springs, in the office of Dr. Friedmann. Cases were exhibited by Dr. Neepor, of opaque nerve sheath; Dr. Libby, of corneal wound, of trachoma, and tabetic optic atrophy. By Dr. Freidmann, disease of the frontal sinus, operated on by Dr. Black. Dr. Bane showed specimens of eyes, enucleated for injury and absolute glaucoma. Dr. Marbourg reported the effect of dionin in electric burn and cases of leucoma. Dr. Libby reported a case of polyoid growth of the conjunctiva. Dr. Jackson demonstrated Van der Berg's method of measuring ametropia by subjective skiascopy.

DEATHS.

Dr. Wm. B. Shuttleworth, a graduate of Jefferson Medical College, class of 1887, and formerly engaged in practice at Martin's Ferry, Ohio, died in Denver, December 18.

NEWS ITEMS.

Dr. J. F. Coleman has removed from La Junta, to his old location at Montrose.

Dr. Geo. F. Libby has removed from Colorado Springs to the McPhee Building, Denver.

Dr. Frank Finney of La Junta, who was recently operated on for appendicitis, has returned to his work.

Dr. G. W. Phillips of La Junta, the pioneer physician of Otero county, 82 years old, who retired from active practice about a year ago, has sustained a fracture of the right hip, having been pushed over by his pet dog.

In the malpractice suit against Dr. D. R. Lucy of Denver, the jury failed to agree, and

the doctor is liable to the annoyance and expense of another trial.

The latest accounts indicate that Dr. S. T. Jarecki will recover from the murderous assault made upon him while performing his duties as County Physician.

BOOKS.

Text-Book of the Diseases of the Eye.—Howard F. Hansell, M. D., and Wm. M. Sweet, M. D.; 547 pages; 256 illustrations. Philadelphia; P. Blakiston's Son and Company. 1903.

This is the most important new treatise upon its subject that has appeared in the last year. Its illustrations of clinical appearances and manipulations gives it especial value to the practitioner who has to deal with the diseases of the eye, without the preparation of a wide clinical experience. For the specialist the chapters upon "Diseases of the Lacrimal Apparatus, Orbit, and Cavities Accessory to the Orbit," by C. R. Holmes of Cincinnati; "Ocular Symptoms in General Disease," by C. A. Wood of Chicago; and "The Pupil in Health and Disease," by Wendell Reber of Philadelphia, possess great interest.

Lessons on the Eye.—Frank L. Henderson, M. D., St. Louis. Third edition; 205 pages; 138 illustrations. Philadelphia; P. Blakiston's Son and Company. 1903.

This work is designed for the under-graduate student and gives only what the author believes every student should master. The fitting of glasses, skiascopy, ophthalmoscopy and kindred subjects, he believes, belong to post-graduate instruction.

Manual of Diseases of the Eye.—C. A. Veasey, M. D.; 412 pages; 10 colored plates and 194 engravings. Philadelphia and New York; Lea Brothers and Company. 1903.

This manual is intended for students and general practitioners. They will find it a definite and safe guide. The colored plates are, most of them, of better quality than are usually found in such works, and both subject matter and illustrations have been carefully selected.

Manual of Diseases of the Eye.—C. H. May, M. D., Third Edition, Revised, With 275 Illustrations, Including 16 Plates, With 36 Colored Figures. New York; Wm. Wood & Co. 1903.

May's book was always notable for the practical value of its illustrations, and the principal additions in the new edition are cuts showing common manipulations of the eye, as the eversion of the lids, application of copper stick, and rolling for trachoma.

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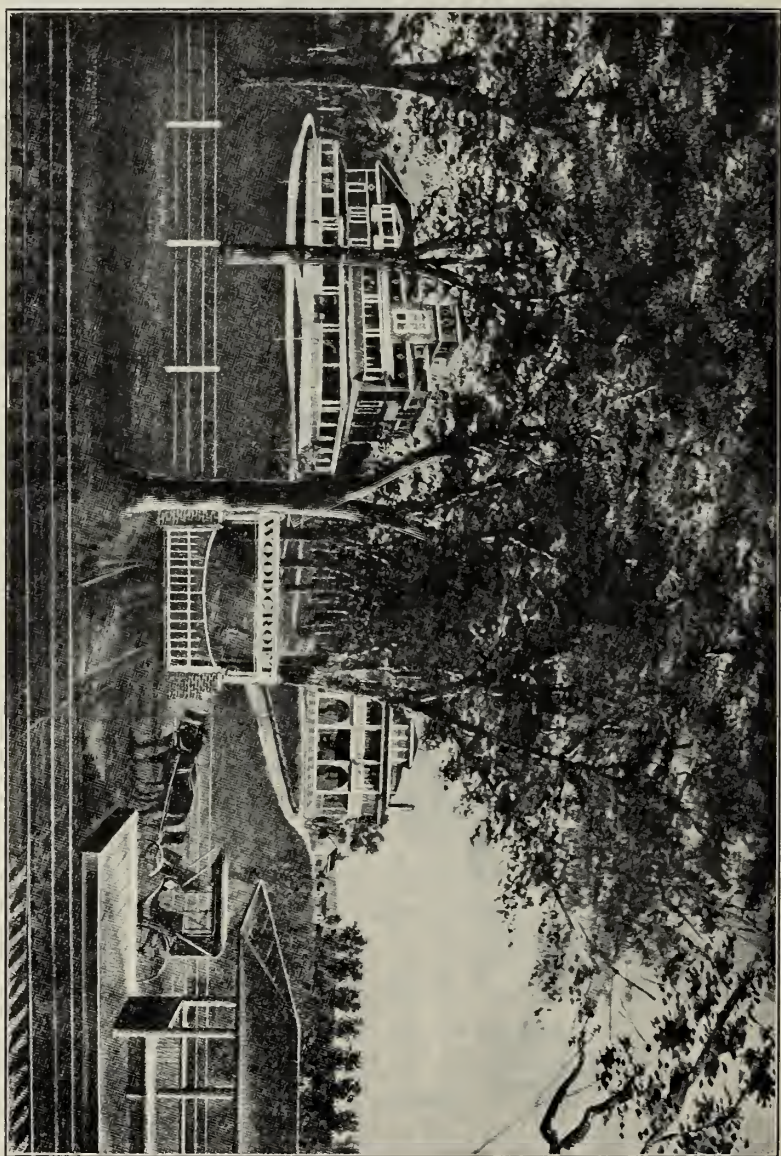
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